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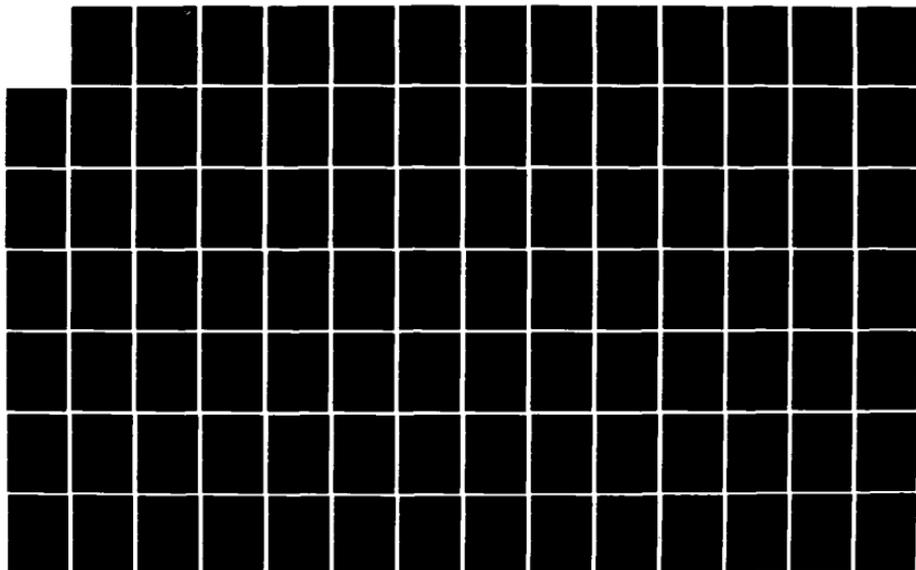
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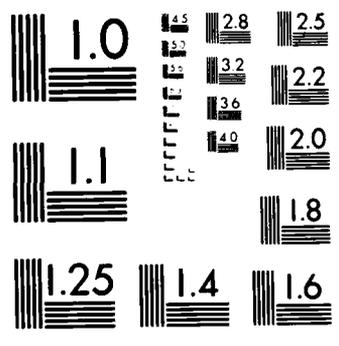
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EXTENDED DEVELOPMENT PROCEDURE

EDeP

ADVANCED REFERENCE MANUAL

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November, 1982

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Sponsored by the Training Developments Institute
U.S. Army Training and Doctrine Command
Fort Monroe, Virginia

83 08 10 037

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AD A 131380

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Acknowledgement

Primary guidance, encouragement and considerable understanding were provided by Training Development Institute contract monitors Major Ron Tarr and Mr. Edward Shepherd. Their extensive knowledge of the need for these manuals, as well as their awareness of the challenge in actually prescribing instructional design procedures, made communication relatively easy and highly professional.

Purple hearts are also in order for the interpreters of penmanship and dictation skills (or lack thereof) employed by project authors. Margaret Patton and Harriet Gore are to be commended for typing and word processing perseverance well beyond the normal call of duty.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER	2. GOVT ACCESSION NO. A131380	3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Extended Development Procedures (EDeP) Advanced Reference Manual		5. TYPE OF REPORT & PERIOD COVERED Final Report	
		6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) Charles M. Reigeluth, et al Syracuse University		8. CONTRACT OR GRANT NUMBER(s) SSP: TNC81-115(N)RO 741-81	
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Training & Doctrine Command Training & Development Institute ATTN: ATTG-DOR Ft Monroe, VA 23651		12. REPORT DATE November 1982	
		13. NUMBER OF PAGES 98	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified	
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for Public Release; distribution unlimited			
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)			
Basic Components	Activity Materials	Procedures	Appraisal
Enrichment Components	Learner Preparation	Guidelines	Specifics
Group Activities	Sequenced Lecture	Projects	Rapport
Realism Level	Goals	Tutor/tutoring	Feedback
Activity Rules	Prerequisite Skills	Remedial	Discussion
			Management
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)			
This is a reference manual (not a training manual). It is an advanced supplement to 'Extended Development Procedures (EDeP) User's Manual.' The order in which the chapters are used does not matter. However, mastering of one chapter is recommended before moving to another in order to consolidate knowledge of the material covered. Failure to consolidate skill before expanding with result in loss instead of gain.			

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EXTENDED DEVELOPMENT PROCEDURE
(EDeP)
ADVANCED REFERENCE MANUAL

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Introduction

About this Manual

This manual is an advanced supplement to the Extended Development Procedure (EDeP): User's Manual. It should only be used after you have had considerable practice in using the User's Manual.

When you are ready to begin using this Advanced Reference Manual, keep the following in mind:

- This is not a training manual! It is a reference manual. Try to take a workshop on the use of this manual before you try to use it.
- Do not try to learn to use the whole manual at once! It has too much in it. Try mastering one chapter at a time, consolidating your knowledge of one chapter for several weeks before attempting to take on another one. It does not matter what order you learn the chapters, so pick them in the order of frequency that you would be likely to need to use them. If you do not consolidate your skills before expanding them, you will lose what you once had. This manual is designed to grow with your skills. You and the quality of your instruction will suffer if you try to move too fast!

One final comment about using this manual: Don't let these nice, neat, mechanical procedures prevent you from using your own creativity and intuition. There are still a lot of things we don't know about what makes good instruction. We do offer you a lot of good guidance, but your best bet is to combine these prescriptions with your own creativity and that of other members of your team -- especially experienced instructors.

CHAPTER 1
STRUCTURE AND SEQUENCE THE INSTRUCTION

SUPPLEMENT FOR STEPS 3 AND 4
PRINCIPLE-BASED SEQUENCING

Overview

- Step 3 Alternate (Principles instead of Rules):
Design a Simple-to-Complex Sequence of Blocks Based on Principles
- Step 4 Alternate (Principles instead of Rules):
Sequence the Content within each Block

STEP 3
ALTERNATE
DESIGN A SIMPLE-TO-COMPLEX SEQUENCE OF BLOCKS BASED ON PRINCIPLES

If the unit content (from Step 2 of the User's Manual) is primarily principles, do this step. Otherwise, use Step 3 in the User's Manual. Decide which principles will be taught in each block of each unit, and design a simple-to-complex sequence for those blocks. It is the principles that should be arranged in the simple-to-complex sequence.

Purpose

When it is more useful to teach underlying knowledge than individual rules (or if the underlying knowledge is relatively more important than the rules), then the simple-to-complex sequencing of the unit should be based on those principles. Any rules that should also be taught are then plugged into the most relevant part of that principle-based sequence. The simple-to-complex sequence starts the instruction with principles that are easier to understand and more broadly applicable, but they provide less guidance. This sequence is likely to result in more stable cognitive structures (which in turn means better retention and transfer or problem solving) and more appealing instruction.

Inputs

- a. All the outputs from Step 2.
- b. Subject Matter Expert (SME) or Experienced Instructor (EI).

Substeps

3.1 Help the SME (or EI) to decide what principles he or she would teach if he or she only had the soldiers for a total of 8-16 hours of instruction before they had to go to the field to do the task unaided. Designate these principles for Block 1 of the unit.

- In deciding which principles can be taught in the 8-16 hours, keep in mind that the emphasis should be on application-level instruction -- teaching the soldier to use those principles to generate appropriate performances of the task (which means using lots of examples and practice) -- rather than on remember-level instruction -- listing or summarizing the principles. You should end up with very few principles! Trying to teach too much in too little time will have disastrous effects on the quality of the instruction.
- The selection of 8-16 hours as a block of instruction is based on research which suggests that approximately 10 hours is the smallest block of instruction to show observable effects of sequencing. Shorter blocks can usually be reorganized by the human mind, thereby wiping out any effects of sequencing for those shorter blocks.
- The principles selected in this substep will usually be the most inclusive and fundamental principles in the subject matter area. They are also usually the ones that were discovered first in the historical development of the area.
- If you used TRADOC's ETAP for the task analysis, this underlying knowledge was identified in a simple-to-complex order, so your sequence will be pretty well laid out for you in the results of that analysis.

3.2 Help the SME (or EI) to decide what additional principles (or more detailed, complex versions of the initial principles) he or she would teach if he or she only had the soldiers for an additional 8-16 hours of instruction, and designate these for Block 2 of the unit.

3.3 Continue this process until you have allocated all of the principles to blocks.

3.4 Make sure that the unit is of appropriate length. Make arrangements to increase the allotted time, or move content from the end of this unit to the beginning of the next unit, if necessary.

3.5 If you are designing more than one unit, repeat Step 3 for each remaining unit.

Outputs

- a. A list of principles for each block of each unit in the curriculum.
- b. An indication of the sequence in which the blocks of each unit will be taught.

STEP 4
ALTERNATE
SEQUENCE THE CONTENT WITHIN EACH BLOCK

If the content is primarily principles, do this version of this step. Otherwise, use Step 4 in the User's Manual.

For each block, identify the steps that should be taught, plan on starting with a demonstration of the whole task, sequence the steps, identify any principles that should be taught and nest them within the sequence, and identify any prerequisite concepts or facts and nest them within the sequence.

Purpose

This step is extremely important. If the appropriate steps are not identified, then you will not be teaching what the learners need to know. A good demonstration illustrates the objective in a concrete and motivational way that is usually superior to any verbal statement of the objective for the block. Including relevant principles in the instruction can make the rules more meaningful and can result in better transfer to new situations. A failure to identify and include prerequisite concepts and facts is likely to result in instruction that fails no matter how well the rest of it is designed.

Inputs

- a. The list of rules for each block.
- b. The task description from the task analysis.
- c. EI.

Substeps

4.1 Pick one block for one unit, and help the EI to check the list of principles to see if any of them have any prerequisite principles that have not yet been mastered by the learners. If yes, then help the EI to identify all such principles.

- Prerequisite principles are those which are more fundamental and inclusive and which must therefore be understood before the narrower, more complex principle can be understood.
- If an ETAP task analysis was performed, then this substep can be done very simply by checking the results of the ETAP analysis to see whether or not any of the principles are above the first level above entry level (disregarding prerequisite concepts and facts). If any are above that level, then make note of all prerequisite principles down to that level.
- If no ETAP analysis was performed, then help the EI (or a SME) to identify all such principles. You may wish to refer to the ETAP User's Manual for guidance in doing this.

4.2 If possible, plan to start the instruction with a real-world demonstration that is representative of the block activities, but does not demonstrate the entire activity.

- A demo of the entire activity would probably be overwhelming for the learner. The demo does not serve to impart any skills; rather it serves to give an overview or schema which provides a meaningful context to which the following instruction can be related.
- The demo should be highly representative of the whole task, but it

should be as simple a case of the task as is possible while still being representative of its fundamental nature and processes.

- The demo should not involve highly mobile events, highly changeable circumstances, or highly dangerous tasks.

4.3 Arrange the principles identified in 4.1 (including prerequisite principles) in a simple-to-complex sequence, with the following exceptions:

- If the real world environment for the block task(s) is not the same as the classroom environment, then arrange for principles that can be taught in the cheapest, most abstracted environment to be taught first, followed by principles for progressively more expensive and more realistic environments. For this instructional sequence to be effective, though, a general overview (in the form of a demonstration) of a simple version of the whole task should first be presented to the learner (see Substep 4.2 above). Only after seeing the overall picture can the extracted knowledges and skills be learned most efficiently and with high motivation.
- If the instruction should occur in different locations and it is expensive or time consuming to switch locations, or difficult to schedule locations, then group principles according to the location in which they should be taught.

4.4 If there are any broad rules that should be taught in this block, decide when they should be taught in relation to the principles that have already been sequenced.

- Such rules are ones which are used to guide the learner as to which principles should be used when during a performance of the task.
- It is often helpful to teach them both before and after the set of principles to which they relate.

4.5 If there are any supporting rules that should be taught in support of individual principles, sequence them immediately after (or immediately before) their related principles.

4.6 Inspect the task description (from the task analysis) for any prerequisite concepts or facts which may exist for any principles or rules. With the help of the EI, make sure that no prerequisites have been left out. Plan for each prerequisite knowledge to be taught immediately before the principle or rule for which it is prerequisite, with the following exception:

- If concepts are highly interrelated (e.g., with parts or kinds super-/co/subordinate relationships), then group them. In other words, if any concept is either a kind or a part of another concept (e.g., verb is a kind of word), then those two concepts should be taught back-to-back. Also, if any two concepts are either kinds or parts of another (single) concept (e.g., verb and noun are both kinds of a single concept, word), then those two concepts should be taught simultaneously.

4.7 Repeat Step 4 for each remaining block of each remaining unit.

Outputs

- a. A list of all principles that will be taught in each block of each unit.
- b. An indication of the sequence in which those principles will be presented within each block of each unit.
- c. An indication of when each relevant rule will be presented within each block of each unit.
- d. An indication of when each prerequisite concept or fact will be presented within each block of each unit.

CHAPTER 2
DESIGN THE INSTRUCTIONAL COMPONENTS

SUPPLEMENT FOR STEPS 6 AND 7
MORE ON BASIC AND ENRICHMENT COMPONENTS

Overview

Step 6 Supplement (Content Requirements)
Plan the Nature of each Basic Component

Step 7 Supplement (Richness Requirements)
Plan the Enrichment Components

STEP 6
SUPPLEMENT
PLAN THE NATURE OF EACH BASIC COMPONENT

Identify the content requirements of the instruction on a skill or knowledge, and plan the basic components of the instruction (presentations, generalities, examples, and practice) accordingly. Keep in mind that the characteristics of each of these components will differ depending on whether it is a fact, concept, principle, or procedure.

Purpose

It is not easy to decide what should be included in a generality and what should not. Nor is it easy to decide what the examples should show or be like. The same is true, although to a lesser extent, for remember-level instruction. The purpose of this step is to provide some guidance as to how to make the basic components of instruction more effective and at the same time make the design process go more quickly for you.

Inputs

- a. Task description from the task analysis, or a statement of the objectives.
- b. SME or EI.

Substeps

6.7 Decide whether the content type of the skill or knowledge is a fact, concept, principle, or procedure.

- If you have not received training in distinguishing between facts, concepts, principles, and rules, then go for help to someone who has.
- If you have selected the application model (sometimes referred to as the use-a-generality model), then it cannot be a fact, because a fact has no generality.
- If the skill or knowledge concerns merely relating two referents (things, events, or labels), then it is a fact.
- If it concerns class membership, then it is a concept. Class membership is artificial -- it is imposed on the world by people.
- If it concerns causes or effects, or other natural states, then it is a principle.
- If it concerns methods for achieving a goal, then it is a rule. Rules are somewhat arbitrary -- there are usually "many different ways to skin a cat".

Remember Model

6.8 Identify the content requirements for the stimulus and the response.

- The information that should be in each of the two elements of the presentation will vary depending on the content type. Guidelines are shown on the next page.

	FACT	CONCEPT	PRINCIPLE	RULE
Remember a Gener- ality	Stimulus	Name	Name	Name or goal
	Response			Definition Include all critical attributes
Remember an Instance	Stimulus	Instance Show critical attributes	Instance	Name or goal
	Response	Symbol/ object/ event	Name	Name of the Principle

*Sometimes you may want the stimulus to be one change (either the cause or the effect) and the response to be the other.

6.9 For the remember model, plan for the practice to provide one of the two elements (the stimulus) and to require the learner to either recognize or recall the other (the response). Plan for the practice to include recognition of the correct response, recall of the correct response, or both (first recognition and then recall).

- If the job requirement entails recognizing, then the practice should also require the learner to recognize the correct response.
- If it entails recalling, then:
 - if the task is easy to learn, plan for all practice to require recall of the correct response.
 - if the task is difficult to learn, plan for the practice to start by requiring the learner to recognize the correct response, and once that level of remembrance has been mastered, plan to move on to requiring the learner to recall the correct response.
- Sometimes the real-world task will always require one of the two elements to be the response, in which case the practice should always use that same element as the response. All other times, plan to switch elements as stimulus and response during the repetitions.
- In all other ways, the practice should be identical to the presentation. The major difference is that in the practice the response element is provided in the feedback.

Application Model

6.10 For the application model, plan the kinds of information that the generality should contain. This will vary depending on the content type: concept, principle, or rule.

- Guidelines are as follows:

Concept	Principle	Rule
<ul style="list-style-type: none"> • Name • Superordinate class • Critical attributes 	<ul style="list-style-type: none"> • Name • The cause • The effect • The relationship between the two 	<ul style="list-style-type: none"> • Name • Goal • Steps (in proper order), including any decision steps and branches

- The generality for a concept should contain: (a) a label for the concept, (b) reference to a superordinate concept, and (c) the common characteristics and/or the function that distinguish members of this concept from other members of the superordinate concept.
- The generality for a rule should contain: (a) the name for the rule, if one exists, (b) the goal or purpose of the rule, (c) a description of inputs and outputs, and (d) a chronological listing of the steps that should be followed to achieve that goal.
- The generality for a principle should contain: (a) the name of the principle, if one exists, (b) identification of all causes that comprise the principle, (c) identification of all effects that comprise the principle, and (d) a clear description of the relationship (between the cause and the effect).

6.11 For the application model, plan the kinds of information that the examples should illustrate, again based on the content type.

- Guidelines are as follows:

Concept	Principle	Rule
<ul style="list-style-type: none"> • Name • Instance (object event, or idea), with all critical attributes shown 	<ul style="list-style-type: none"> • Name • Instance (event, situation, or problem), with the cause, effect, and relationship between them shown 	<ul style="list-style-type: none"> • Name • Goal (outputs) • Givens (inputs) • Instance, with all its steps (including decision steps) shown in the proper order

- Each example for a concept should show the common characteristics and/or the function described in the generality. It should also identify the example with the concept label. Additional information for the examples is described in Step 6 below.

- Each example for a rule should specify the goal, it should show the use of each individual step for a specific case, it should show the inputs and outputs for that case, and it should identify the example with the rule name (if one exists).
- Each example for a principle should show a change relationship between two or more events (or situations), and it should identify the example with a principle name (if one exists). This should include a description of both changes (or situations) and a description of the relationship between those changes.
- The setting and other kinds of variable characteristics should be as similar as is feasible (and cost effective) to the on-the-job characteristics.

6.12 For the application model, plan the kinds of responses that the Practice should elicit and the kinds of information that they should provide, again based on the content type.

- Generally, practice items at the application level contain identical information to examples, except that much of it is withheld until the feedback. Guidelines are as follows:

	Concept	Principle	Rule
Stimulus	<ul style="list-style-type: none"> • New Instance (object, event, or idea), with all critical attributes shown • Request for name 	<ul style="list-style-type: none"> • New instance (event, situation, or problem), with either the cause or the effect shown • Request for prediction (the effect) or explanation (the cause) 	<ul style="list-style-type: none"> • New inputs • Goal and/or • Request for outputs
Response	<ul style="list-style-type: none"> • Name 	<ul style="list-style-type: none"> • Prediction (effect) or explanation (cause) 	<ul style="list-style-type: none"> • Performance of steps • Creation of outputs

- Each practice item for a concept should present an example or non-example and require the learner to classify it as belonging or not belonging to the concept class. The feedback for the response (a) should not be available to the learner before his response, (b) should be presented immediately after the response or immediately before the next practice item, (c) should show what the correct answer is, and (d) should explain why it is the correct answer.
- Each practice item for a rule should include a statement of the goal of the specific example and a description of all necessary inputs. The practice items should be interchangeable with the examples of the rule except that the description of the steps is not provided and the learner is required to do them on his or her own.
- Each practice item for a principle should provide a statement or question requesting the learner to explain or predict a specific example of a change that has or will come about because of its relationship to another change or changes. The practice items are

interchangeable with the examples of the principle, except that the relationship and one of the changes are provided only on the feedback.

- The setting and other kinds of characteristics of the stimuli and the responses should be as similar as is feasible (and cost-effective) to the on-the-job characteristics.

Outputs

- The selection of the appropriate content type for a single skill or knowledge.
- A "blueprint" as to what the basic components of the instruction (presentation, generality, examples, and/or practice) should be like.

Examples

The following are examples of characteristics of the basic components that you might make reference to in your blueprint. However, you should not actually develop these components at this point in time.

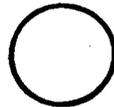
Concept

Generality: A convex lens is a lens which is thicker in the middle than at the edges.

Example: This is a drawing of a convex lens:



side view



front view

Practice: "Is this a convex lens?" (Instructor holds it up in front of the class.)

Rule

Generality: To convert a magnetic bearing to a grid bearing, you must first identify the magnetic declination. If it is a west declination, subtract it from the magnetic bearing to get a grid bearing. If it is an east declination, add it to the magnetic bearing.

Example: This is how you convert a magnetic bearing to a grid bearing (Instructor demonstrates the rule using a compass and a map.)

Practice: Here are a topographic map and a compass. Assume that you are located at the red "X", and the compass bearing of your course is 240 degrees. What is the grid bearing of your course?

Principle

Generality: The passing of a cold front usually causes rain or snow.

Example: The snow storm yesterday was caused by a passing cold front.

Practice: What will happen if that cold front passes through our base tomorrow?

STEP 7
SUPPLEMENT
PLAN THE ENRICHMENT COMPONENTS

Based on the desired richness level (from Step 7 in the User's Manual), plan any additional enrichment components that the instruction in this skill or knowledge should have.

Purpose

If the skill or knowledge is difficult to learn, enrichment components can greatly improve the effectiveness of the instruction.

Inputs

- a. Task level of the skill or knowledge.
- b. Richness level (from Step 5 of the UM).
- c. The nature of each basic component (from Step 6 of the ARM).
- d. An EI and a SME.

Substeps

Remember Model

7.5 On the basis of the prescribed level of richness for the instruction, have the EI identify all the representations which would be useful to help the learner to pair (or remember) the stimulus and the response.

- This should include both the type and number of different representations.
- Keep in mind that some learners learn better when knowledge is represented in one form, others when it is represented in a different form, and still others when it is represented in two different forms. Hence, using several representations will "cover all bases". For example, if there is both a verbal representation and a visual representation, then learners who are weak in either one of these modes of perception will not be at a disadvantage.
- Keep in mind that, for difficult skills and knowledges, the early presentations and practice should be simplified in some way, and that some less realistic representation forms (such as line diagrams as opposed to photographs) are an excellent way to do so.

7.6 If the information that is to be remembered is a generality (determined in Step 6 of the ARM above) and it needs to be understood (remember-paraphrase level of performance, also determined in Step 6), then help the EI to identify whether or not there is a reference example that would help learners to remember the generality. If there is, then make note of it.

- Providing learners with a prototypical example that they can visualize during recall can often help them to remember the generality.

7.7 As the richness level increases above a 2, you should plan to: (1) increase the number of repetitions, (2) use alternative representations, especially visuals, (3) use a good memory device if you can find or create one, and/or (4) use attention-focusing devices.

- Visual representations are often much easier to remember than verbal representations.
- Paraphrasing the information can also help learners to remember by helping them to meaningfully assimilate the knowledge.
- Rhymes, sayings, and songs are helpful memory devices for some kinds

of information (e.g., the "A B C" song, the "Thirty days have September, ..." rhyme, the "Every Good Boy Does Fine" saying for the order of notes on the scale -- EGBDF).

- Anything that helps the learner to form a visual image is another useful kind of memory device (e.g., a picture, a movie, a diagram, flowcharts, or even instructing the learner to visualize in a certain way).
- Vivid stories or anecdotes that contain the information that is to be remembered can be very effective memory devices, as long as there is a minimum of irrelevant information that might interfere with memory of the relevant information.
- Attention-focusing devices include italics, bold-faced print, color, notes, and formatting for written materials (print or CAI); well-timed pauses, inflection, loudness, and special comments for audio presentations (live or recorded); and zooms, camera angles, and audio commentary for motion picture presentations, among others.

Application Model

7.8 If the application model was selected, then as the richness level increases above a 2, you should plan to do the following:

- Increase the number of examples and practice items.
- Use attention-focusing devices on the generality, examples, and practice feedback. They include italics, bold-faced print, color, exploded diagrams, notes, and formatting for written materials (print or CAI); the "pregnant pause", inflection, loudness, and special comments for audio presentations (live or recorded); and zooms, camera angles, and audio commentary for motion picture presentations, among others.
- Use alternative representations of the generality, examples, and/or practice, if appropriate. These include real objects and events, visual representations, and paraphrased verbal or symbolic representations.

Keep in mind that the examples and practice should be as similar as possible to the real-world stimuli and responses, and that the full variety of representations for the real-world task should also be used in the instruction.

Also keep in mind that, for difficult skills and knowledges, the early examples and practice should be simplified in some way, and that some less realistic representation forms (such as line diagrams as opposed to photographs) are an excellent way to do so.

Finally, keep in mind that it helps many learners to have the same knowledge presented in two (or more) different forms. For example, if there is both a verbal representation and a visual representation, then learners who are weak in either one of those modes of perception will not be at a disadvantage.

- Make each example as different as possible from all previous examples. This helps the learner apply the generality to the full variety of new cases. There are two important ways that examples may differ from all previous examples:
 1. Each example has innate differences from the other examples. Examples of mammal differ on the basis of kind of mammal -- dog, bear, elephant, etc.
 2. An example can usually be presented in a variety of representations. For example, you can present a real dog, a picture of a real dog, a drawing of a real dog, or a verbal description of a

real dog.

- Use an easy-to-difficult order for presenting the examples and practice. In order to place the examples in an easy-to-difficult order, all the ways in which the examples are divergent should be considered. An EI can usually do a good job of arranging examples and practice in a good order. Otherwise, you will need to perform a test in which you try out the examples and see which ones the learners find most difficult, if resources and time permit.
- Point out common errors if you feel that such will help prevent the learners from making those errors. In the case of concepts, this is done by presenting a matched non-example, which 1) is not an example of the generality of interest, and 2) is as similar as possible (matched) to an example. In the case of procedures and principles, this is usually done with cautionary comments.

Outputs

- a. A detailed plan or "blueprint" as to what enrichment strategies should be used in the instruction on this skill or knowledge.

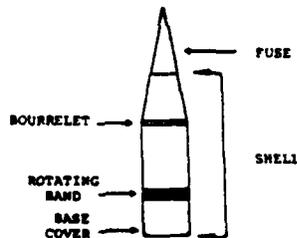
Examples

The following are examples of richness components:

Memory device:

Roy G. Biv, an acronym used to remember the order of the colors of the spectrum (Red, Orange, Yellow, Green, Blue, Indigo, Violet).

Alternative representation:



A line drawing of the exterior parts of an artillery projectile is an alternative representation.

Attention-focusing Device:

Underlining and **BOLD FACE TYPE** are two kinds of attention-focusing devices that can be used in written materials.

Example divergence:



Showing several types of convex lenses is an example of divergence for the concept "convex lens".

Easy-to-difficult order:

For teaching the concept "convex lens", present line drawings first,

because they are uncluttered with irrelevant things that are present in real objects and pictures, and because they are less abstract than verbal descriptions.

Present the line drawings all in the same position at first, to facilitate comparison of examples and avoid confusion.

Present this type of lens first



present this type second



and this type third



because the latter two are progressively more ambiguous.

The above examples should be followed by other examples that show the lenses in different positions, and then still others that present progressively more difficult alternative representations of convex lenses.

Matched nonexamples:



Contrasting an example of a convex lens with a nonexample that is commonly mistaken for a convex lens will help learners to learn this concept.

CHAPTER 3
GAME FORMAT FOR INDIVIDUALIZED RESOURCES*

SUPPLEMENT FOR

STEP 11
CREATE THE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 1
INDIVIDUALIZED RESOURCES

Overview

11.2 Allocate content to individual games.

For each game:

11.3 Plan the game requirements.

11.4 Design a general format.

11.5 Design the basic rules and game equipment.

11.6 Design other approaches and instructor's manual.

Next game.

* For group games, see Chapter 4, "Group Activities", on p. 26 of this manual.

STEP 11.2
ALLOCATE CONTENT TO INDIVIDUAL GAMES

Decide how many different games to have in this block and which skills and knowledges will be taught in each of those games. Then plan on any other approaches that should be used for any of the basic components which were prescribed for the skills and knowledges.

Purpose

It is highly unlikely that the game format has been selected as the only instructional approach for this block. Therefore, it is important to decide what content and what basic strategy components for that content will be presented via game. Failure to plan sufficient accompanying approaches will severely reduce the effectiveness of the instruction.

Inputs

- a. The selection of skills and knowledges to be taught by the game approach for this block (from Step 11.1).
- b. The "blueprint" for each of those same skills and knowledges (from Step 5).
- c. An EI.

Substeps

11.2.1 Inspect the results of Step 11.1 for this block, and identify all skills and knowledges for which the game format was selected.

11.2.2 Decide whether all of those skills and knowledges should be taught in a single game, or whether more than one game is desirable. In other words, this Substep entails deciding how many different games to have in this block and which skills and knowledges will be taught in each of those games.

- This decision can be further refined in Substep 11.3.2.
- It may be desirable to create more than one game for a single skill.

11.2.3 Pick one of the skills and knowledges for one of the games identified in Substep 11.2.2, and decide whether the game can and should be used for all the basic components prescribed in Step 5 (presentation, generality, examples, and/or practice), or whether an additional approach (such as tutoring or non-game individualized resources) will be necessary to present some of the basic components.

- Usually, the game format is used just for practice, but not always.

11.2.4 If repetitions, examples, and/or practice are to be included in this game, then decide whether all that were prescribed will be included in this game, or whether an additional approach will be necessary for some of the prescribed number of repetitions, examples, and/or practice.

- For the remember model, this entails determining the number of prescribed repetitions and alternative representations of the presentation and/or practice that will be incorporated into the game.
- For the application model, this entails determining the number of prescribed examples and/or practice that will be incorporated into the game.

11.2.5 For any prescribed components that will not be incorporated into the game, plan what approach will be used to present them. Then repeat Substeps 11.2.3 - 11.2.5 for each remaining skill or knowledge for each game.

- Options include games, tutoring, non-game individualized resources, lecture, and perhaps others.

Outputs

- a. A decision as to how many different games to have in this block and which skills and knowledges will be taught in each of those games.
- b. A plan for the approach(es) for presenting any of the prescribed major strategy components that will not be taught by games.

STEP 11.3
PLAN THE GAME REQUIREMENTS

Review the motivational requirements, stimulus requirements, and performance requirements for the skills and knowledges allocated to this game, and decide on their realism requirements.

Purpose

The characteristics that the game ought to have depend on the kinds of requirements that the game needs to meet.

Inputs

- a. A description of the skills and knowledges allocated to this game (from Step 11.2).
- b. Motivational requirements for this game (from Step 11.1).
- c. Stimulus and performance requirements for this game (from Step 6).
- d. An EI.

Substeps

11.3.1 Pick one game and review the results of Step 11.1 to identify the motivational requirements for the skills and knowledges that were allocated to it in Step 11.2. Also, review the results of Step 6 to identify the stimulus and performance requirements for those skills and knowledges.

11.3.2 Pick one game and decide whether or not its behaviors or conditions of performance are so complex and difficult as to warrant the use of several games in a "progression of realism" rather than a single game.

- If you chose several games in a progression of realism, then pick the least realistic game and do Steps 11.3 - 11.6. Repeat these Steps for each additional game.
- The use of several games in a "progression of realism" would entail starting the learner with a very low-realism-level game, which is usually less expensive to operate and easier for the learner to learn from. After the learner's skills and knowledges have developed to a certain point, he or she would advance to a game with a higher realism level to further develop those same skills and knowledges.
- If the skills and knowledges are very difficult and/or the real-world conditions of performance are very complex, then a progression of realism is advisable.
- There is a realism continuum that runs from very abstract paper/pencil games through simulations to actual real-life games. Normally the real life-situation provides the best practice, but it also tends to be the most expensive and/or time consuming.

11.3.3 Pick one game, and decide if safety is a concern for choice of realism level, given the nature of the task and the entry-level ability of the learners. If yes, eliminate from consideration the levels of realism that are too dangerous. If this narrows the choice to one, pick it and skip to Step 11.4.

11.3.4 Identify and compare the advantages and disadvantages of each remaining realism level, and pick the one which best meets the instructional

and logistical requirements. The following are some (but by no means all) of the criteria that you may wish to consider:

- ability to meet stimulus requirements
- ability to meet performance requirements
- ability to meet feedback requirements
- ability to meet motivational requirements
- expense to design and/or implement
- flexibility
- ability to allow cuing and guidance
- logistics/practicality
- others?

11.3.5 If several games at different levels of realism are desirable for this set of skills and knowledges, repeat Substeps 11.3.3 and 11.3.4 for each remaining level of realism.

Guidelines

- Facts and concepts do not usually require a high level of realism.
- If frequent feedback is necessary, simulated and abstracted environments are usually better than real-world environments.
- High realism is important when objectives include changing soldiers' attitudes.
- Simulation games are useful
 - when a time-accelerated representation of reality is desirable.
 - when the task to be learned is very dangerous but realism is beneficial. This allows learners to experiment in a safe situation.

Outputs

- a. A decision as to the realism level for this game.
- b. If a progression of realism is desirable, a decision as to the realism level for each game in that progression.

STEP 11.4
DESIGN A GENERAL FORMAT

Design a general format for the game.

Purpose

The developer must have a general idea of what the game is going to be like before he or she can start developing the details of the game. It is important to keep in mind that this is just a general idea of the structure of the game.

Inputs

- a. Description of skills and knowledges selected for the game (from Step 11.2).
- b. Description of the desired characteristics of the instances (from Steps 6 and 7).
- c. Realism level for the game (from Step 11.3).
- d. An EI.

Substeps

11.4.1 Decide on a basic format for the game. The following are some common formats, but this is by no means an exhaustive list.

a. Role-playing Games:

The two most important steps in designing a role-playing game are (1) planning the scenario and (2) planning the details. Planning the scenario involves specifying the performance and the conditions of performance. Planning the details involves assigning roles and scheduling sessions.

- An example of a role-playing game is a competitive, decision-making game where the individual represents a company competing against a computer. Typically the necessary information is fed into the computer. Learner decisions determine the background for the next set of decisions.
- One special case of the role-playing game is the "action-maze" game. It is a branching programmed text. Information is presented and a problem posed, and the participant is asked to choose a course of action from a list. Depending on his or her choice, different consequences and information are fed back. Unlike conventional programmed learning, however, there are often several "correct" choices.

b. Interpersonal Simulation Games:

These are games in which the participant responds as if in the actual system of interaction being simulated. Interaction is structured by rules and physical circumstances. Resultant interaction ranges from the highly restricted participant behavior of a computer simulation game, through the less inhibited behavior with a so-called "board game", to the flexible, open-ended behavior of a role-playing game, which allows participant behavior to more closely approximate that in the actual system of interaction being simulated. Whatever the format, interpersonal simulation games combine the competitive aspects of gaming with a glimpse of how it "feels" to be in the dynamics of real-system, interpersonal interaction.

- Large system simulation games are effective learning contexts for the examination of the dynamics of complex systems of interaction. Focus may range from looking at the variables affecting the urban community

to a thorough analysis of the nation-state system of the international community.

- Where role-playing is involved in simulation games, it can create strong identification and empathy, but it also carries dangers of over-specific learning and possible role-rejection, especially for self-conscious or inexperienced learners.

11.4.2 Decide on the context or medium within which the game is to be performed.

- This will be based mostly on the realism level and the nature of the stimuli and desired behaviors.

11.4.3 Decide whether an existing game format can be modified to fit the training requirements for the prescribed realism level.

- If yes, decide in general terms on the nature of the modified format.
- If no existing format is suitable, design a simple game format that will accommodate the behaviors.
- In the case of having more than one game for this block of instruction, consider a modular approach in which each game uses a common format but varies in some other ways (e.g., equipment, materials). This would eliminate the need to teach new rules for each game.
- In the case of just one game for this block, you may also want to consider making it an on-going game that uses a single (general) game format but introduces new elements as the training progresses from week to week. This would provide a built-in review mechanism.

11.4.4 Decide in very general terms on the kinds of control mechanisms (e.g. feedback and guidance) that will be used to improve learner performance during the game.

11.4.5 Decide on the general nature of preparations for performing the game (e.g., any training or instruction to prepare learners for the game).

- Include procedures for the instructor to build a "winning mindset" in the learners.

11.4.6— Make a final decision as to which behaviors should be emphasized within the context.

Guidelines

- Plan on the game having several different levels of sophistication and difficulty so that the learner will not get frustrated by starting with a game that is too difficult to do well.

Output

- a. General specifications for game format.

STEP 11.5
DESIGN THE BASIC RULES AND GAME EQUIPMENT

Design and develop the rules of the game and the necessary game equipment and materials.

Purpose

The objectives, rules, and game equipment are what make a game. Therefore, this step is the heart of the design effort for individual games.

Input

a. Game format specifications (from Step 11.4).

Substeps

11.5.1 Establish the goal of the game and the criterion for winning the game.

- The instructional objective is translated into the criterion for winning the game; and this criterion provides the basis for working out the detailed playing procedures.

11.5.2 Plan the detailed playing procedures for the game, based on the goal and criterion for winning the game.

- This entails detailed specification of the sequence of activities, including stimulus presentations, performance options for each major presentation, and stimulus presentations that will follow each performance option.
- Some element of chance should be designed into the game for motivational purposes, but be careful! If the game depends entirely upon the fall of cards or throw of dice, it limits the options for learning. On the other hand, if the game depends upon skill and knowledge only, it can become an unenjoyable test situation.
- Different instructional purposes require different levels of accuracy, detail, and realism. If the desired performance is at all difficult, the procedures of the game should allow for some variation in the levels of these factors.
- Make sure that feedback is incorporated in such a way as to prevent the continued practice of incorrect performances.
- Make the game fun!
- Keep in mind the need for the learner to feel that his or her efforts are the sole reason for doing well in the game.

11.5.3 Design the rules for the game, and develop a rule book or the equivalent.

- The rules should describe what the players are permitted and forbidden to do during the game.
- The goal and possible outcomes of the game should be clearly stated at the beginning of the rules.
- Different instructional purposes require different levels of accuracy, detail and realism. The rules of the game should identify whatever levels or flexibility in levels exist for these differences.
- Keep in mind that the rules should usually be as consistent as possible with the realities of on-the-job performances of the desired skills.

- Keep each round of the game as brief and simple as possible. This practice permits the game to be played repeatedly within a short period of time.
- Simplify the rules of the game as much as possible. Avoid irrelevant embellishments. And make sure to use good principles of instructional design to teach the rules to the learners.

11.5.4 Design a scoring system for the game.

- Scoring should be based on behaviors the game can teach. In other words, make sure that the scoring system of the game is clearly related to its instructional objectives.
- Points should be awarded according to the difficulty or complexity of the performance.
- Penalties and rewards should not be arbitrary.
- Keep the scoring simple, all else being equal.

11.5.5 Design and develop the necessary game equipment and materials.

- Examples are gameboards with a grid, question cards, scorepads, video materials, objects, computer programs, etc.
- For simulation games, the materials should provide: information on context, roles of people (if role-play), and performance options. Context is crucial in a simulation game.
- The two main attributes of simulation games which have to be presented are:
 - a. an abstract representation of reality, and
 - b. design of feedback reflecting real life consequences.

Guidelines

- Clearly identify all necessary equipment so players can determine if materials are missing.
- Package or display the rules in a way that limits the chance of losing them.

Outputs

- a. A rule book or the equivalent, specifying the game rules.
- b. Materials and equipment required for conducting the game.

STEP 11.6
DESIGN OTHER APPROACHES AND INSTRUCTOR'S MANUAL

If any other approaches are to be used in combination with the game (see Step 11.3 above), then design and develop them. Also, prepare the instructor's manual for the game.

Purpose

Games are usually used just for practice, so other approaches will usually be necessary to use in combination with the game(s).

Input

a. Specifications of game rules and materials (from Step 11.5).

Substeps

11.6.1 Design related non-game approaches to accompany the game for the instruction on these skills and knowledges, and plan for their scheduling (that is, when they will be used in relation to the game).

- Use the appropriate section(s) of this manual to design and develop them.
- Activities such as orientation prior to a game (e.g., in a lecture), coaching during a game (e.g., professional tutoring), and discussion after a game (e.g., group discussion) are often considered to be related non-game activities. These should be designed to accompany most game activities.
- Games are often helpful because they abstract or simplify reality. In this way, crucial features are emphasized, and the structure of the model is more easily grasped. But there are dangers in over-simplifying and stereotyping. Discussion afterwards is particularly important to deal with these dangers.

11.6.2 Develop an instructor's guide that explains important procedures for the effective use of the game by his or her learners. Be sure to include guidelines for interfacing non-game activities with the game.

- Have the instructor check regularly to see if any equipment or materials are missing.
- Have the instructor plan for storage of any equipment or materials.
- Have the instructor enforce time limits for responses, if appropriate, to increase the number of responses.
- Give the instructor guidance for training learners before the game, supervising them at the beginning of the game, and monitoring their progress throughout the game.

11.6.3 Repeat Steps 11.4 - 11.6 for any games on other levels of realism for this same set of skills and knowledges.

11.6.4 Repeat Steps 11.3 - 11.6 for any other games identified in Step 11.2.

Outputs

- a. Designed and developed non-game activities to accompany the game.
- b. An instructor's manual for the use of the game and its related non-game activities.

CHAPTER 4
GROUP ACTIVITY

STEP 11
CREATE THE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 2
GROUP ACTIVITY

Overview

- 11.1 Allocate content to activities.
For each activity:
- 11.2 Design the general format.
 - 11.3 Choose realism level.
 - 11.4 Decide on competition.
 - 11.5 Plan how teammates will observe each other.
 - 11.6 Design activity rules.
 - 11.7 Design and develop activity materials.
 - 11.8 Prescribe learner preparation for the activity.
 - 11.9 Finish the instructor's manual.
- Next activity.

STEP 11.1
ALLOCATE CONTENT TO ACTIVITIES

Decide how many different group activities to have in this block and which skills and knowledges will be taught in each of those group activities. Then plan on any other approaches that should be used for any of the basic components which were prescribed for the skills and knowledges.

Purpose

It is highly unlikely that group activity has been selected as the only instructional approach for this block. Therefore, it is important to decide what content and what basic strategy components for that content will be presented via group activity. Failure to plan sufficient accompanying approaches will severely reduce the effectiveness of the instruction.

Inputs

- a. The selection of skills and knowledges to be taught by the group activity approach for this block (from Step 9).
- b. The "blueprint" for each of those same skills and knowledges (from Step 5).
- c. An EI.

Substeps

11.1.1 Inspect the results of Step 4 for this block, and identify all skills and knowledges for which group activity was selected.

11.1.2 Decide whether all of those skills and knowledges should be taught in a single group activity, or whether more than one group activity is desirable. In other words, this Substep entails deciding how many different group activities to have in this block and which skills and knowledges will be taught in each of those group activities.

11.1.3 Pick one of the skills and knowledges for one of the activities identified in Substep 11.1.2, and decide whether group activities should be used for all the basic components prescribed in Step 5 (presentation, generality, examples, and practice), or whether an additional approach should be used to present some of the basic components.

- Usually, group activity is used just for practice, but not always.

11.1.4 If repetitions, examples, and/or practice are to be included in the group activity, then decide whether the entire amount prescribed for each will be included in the activity, or whether an additional approach will be necessary for some of the prescribed number of repetitions, examples, and/or practice.

- For the remember model, this entails determining the number of prescribed repetitions and alternative representations of the presentation and/or practice that will be incorporated into the group activity.
- For the application model, this entails determining the number of prescribed examples and/or practice that will be incorporated into the group activities.

11.1.5 For the prescribed components that will not be incorporated into the group activity, plan what approach will be used to present them. Then repeat Substeps 11.1.3 - 11.1.5 for each remaining skill or knowledge for each activity.

- Options include tutoring, individualized materials, lecture, and perhaps others.

Outputs

- a. A decision as to how many different group activities to have in this block and which skills and knowledges will be taught in each of those group activities.
- b. A plan for what other approach(es) to use for presenting any of the prescribed major strategy components that will not be taught by group activities.

STEP 11.2
DESIGN THE GENERAL FORMAT

Design the general format for the group activity.

Purpose

The developer must have a general idea of what the activity is going to be like before he/she can start developing sections of the instructor's manual and instructional material. It is important to keep in mind that this is just a general idea of the structure of the activity and not the final design.

Inputs

- a. Task description
- b. Learner analysis or EI.
- c. EI.

Substeps

11.2.1 For a real-life or simulated activity:

- Decide on the context within which the activity will be performed.
- Decide which behaviors should be emphasized within the context.
- Decide on the general nature of preparations for performing the group activity (e.g. the instruction that is given to prepare trainees for the activity).
- Decide in very general terms on the kinds of control mechanisms (e.g. direct observation and feedback, periodic debriefing of team members) the instructor or facilitator will be able to use to provide guidance, direction, and feedback during (1) preparation for, and (2) performance of, the activity.
- Decide how trainee performance will be evaluated during conduct of the activity (e.g. instructor observation, successful completion of a test or competition, performance checklists, peer evaluation, etc.).

11.2.2 For an abstract activity:

- Decide on the specific behaviors (within the task area) that the activity will deal with.
- Decide whether an existing game/activity format can be modified to fit those training requirements.
 - If yes, decide in general terms on the nature of the modified format.
 - If no existing format is suitable, design the major aspects of a simple game/activity that will accommodate the behaviors.
- Decide on the general nature of preparations for performing the activity.
- Decide in very general terms on the kinds of control mechanisms the instructor or facilitator will be able to use to provide guidance, direction, and feedback during (1) preparation for, and (2) performance of, the activity.
- Decide how trainee performance will be evaluated during conduct of the activity (e.g. instructor observation, successful completion of a test or competition, performance checklists, peer evaluation, etc.)

Output

- a. A very general "blueprint" of the format for the group activity, including: context, behaviors, preparations, control mechanisms, and evaluation plans.

STEP 11.3
CHOOSE REALISM LEVEL

Pick one activity for this block, and decide on its realism level:

- real life situation
- simulated environment
- abstract environment.

Purpose

There is a realism continuum that runs from very abstract paper/pencil activities through simulations to actual real-life activities. The level of realism chosen will directly influence the form the activity will eventually take. Normally a real-life situation provides the best practice, but it is also usually the most expensive and/or time consuming.

Inputs

- a. SME or EI.
- b. Learner analysis results.
- c. Task description.

Substeps

11.3.1 Pick one activity, and decide if safety is a concern for choice of realism level, given the nature of the task and the entry-level ability of learners. If yes, eliminate from consideration the levels of realism that are too dangerous. If this narrows the choice to one, then pick it and skip to Step 11.4.

11.3.2 Identify and compare the advantages and disadvantages of each remaining realism level, and pick the one which best meets the instructional and logistical requirements. The following are some (but by no means all) of the criteria that you may wish to consider:

- ability to meet practice requirements
- ability to meet feedback requirements
- expense to design and/or implement
- flexibility
- ability to allow cuing and guidance
- logistics/practicality
- others?

Output

- a. A decision as to the realism level for one group activity.

STEP 11.4
DECIDE ON COMPETITION

Question the subject matter expert on the appropriateness of competition as a motivating factor; and if competition is to be used, further develop the nature of the activity so that it allows maximum competition between teams, but discourages competition between teammates.

Purpose

Competition can be a very motivating factor. Studies have shown that competition between teams has a tendency to unify the members of the same team and therefore, can help to create a good atmosphere for developing such team attitudes and skills as cooperation and coordination. There are, however, other times when competition is inappropriate. Whereas competition between teams can be motivating, competition between members of the same team is usually disruptive. Competition often implies a win/lose situation. In many cases the instructor's goal will be to bring every learner up to a mastery level, in which case the intent is to have no losers. However, even in this case, it may be advisable to have trainees compete -- against a criterion. If the motivation of learners and the development of team skills are not important factors in the development of the activity, then competition probably should not be stressed.

Inputs

- a. Learner analysis or EI.
- b. The general format for the activity from Step 11.3.
- c. EI.

Substeps

11.4.1 Help the EI decide whether or not learners require the motivation inherent in competing against another team. If yes, chalk up a point for competition.

- Learner analysis data may be necessary if the EI is not very familiar with the motivational level of the target learners for the target task.

11.4.2 Decide whether or not team skills and attitudes are important. If yes, chalk up a point for competition.

11.4.3 Decide whether or not competing against another team would have any negative effects. If no, chalk up a point for competition.

11.4.4 Based on the above analysis, decide whether or not to use competition between teams.

11.4.5 If competition is to be used, include in the instructor's manual the requirement that the instructor insure that both the teams and the individuals compete against teams and individuals of equal ability.

11.4.6 If competition is to be used, further plan the nature of the activity in such a way that it maximizes competition between teams and minimizes it between teammates.

11.4.7 Regardless of whether or not competition will be used, further plan the nature of the activity in such a way as to allow team members to work together on a joint problem, or to allow team members to work individually but contribute points to a total team score.

Outputs

- a. Decision on the appropriateness of competition between teams as a component of the group activity.
- b. Further plans on how to get teammates to work together or contribute to a common goal.

If competition is to be used:

- c. A section of the instructor's manual emphasizing the importance of teams and individuals competing against teams and individuals of equal ability.
- d. A group activity format that maximizes competition between teams and minimize it between teammates.

STEP 11.5
PLAN HOW TEAMMATES WILL OBSERVE EACH OTHER

Plan the activity format in such a way that it gives team members a regular opportunity to observe the efforts and achievements of their teammates and to reward each other effectively.

Purpose

There is a tendency for some learners not to fulfill their part of the task in a team situation. If given the opportunity these learners will allow teammates to do all the work. Peer pressure can be an effective device to get every teammember to do his or her fair share of the task. Reinforcement from teammates is also an extremely important motivating factor. The primary way that peer pressure and reinforcement from teammates can be applied is by giving team members a regular opportunity to observe the efforts of their teammates. Also, observation of a good teammate's performance can provide much guidance for other teammates to improve their performances.

Inputs

- a. The activity design to date (from Steps 11.2 - 11.4).
- b. EI.

Guidelines

- Either plan the activity so that teammates always work together in preparation for the activity, and/or
- Plan the activity so that teammates can observe the efforts of teammates during competition, and/or
- Plan the activity format in such a way as to make each learner personally accountable for his or her share of the task (e.g. plan to post individual contributions to team scores along with team standings).

Outputs

- a. An outline for a section in the instructor's manual that explains the importance of peer pressure and reinforcement and why the instructor should allow teammembers to observe each other.
- b. An activity design that allows teammembers to observe each other's efforts teammates on a regular basis.

STEP 11.6
DESIGN ACTIVITY RULES

Design the basic activity rules.

Purpose

The nature of the activity is determined largely by the rules; they are the major element to be designed in most group activities.

Inputs

- a. Front-end analysis.
- b. All previous group activities development steps.

Guidelines

- If an element of chance is going to be used as a motivational factor, be sure that the rules keep the element of chance under tight control. Ultimately success in the activity must depend on learning and not on chance.
- Make rules of play fair:
 - Do not give any kind of player an undue advantage.
 - Insure that teams only play against teams of equal ability.
 - Insure that individuals only play against individuals of equal ability.
- Design rules in such a way as to insure that all players are involved with some task or other as much of the time as possible.
 - During each round of the activity, require all players to participate.
 - Exclude rules that eliminate a player from the game as a penalty.
- Keep each round of the activity relatively brief in order to permit frequent feedback and many repetitions of the activity.
- Keep the rules of the activity simple.
- Avoid irrelevant embellishments or additions to the rules or format of the activity.

Output

- a. A set of rules that will serve as the basis for the activity.

Example

The following is an example of a partial set of rules:

1. Place four players of equal ability around the playing board.
2. Turn all letters face down at side of board and shuffle.
3. Draw for first play. The player drawing the letter nearest the beginning of the alphabet draws first.
4. Put exposed letters back and reshuffle.
5. Player rolls dice and chooses the number of letters indicated on the dice.
6. Player makes one or more words using all or part of the letters. If player is unable to make a word, he or she forfeits the turn and passes the dice to the player at the left.

STF 11.7
DESIGN AND DEVELOP ACTIVITY MATERIALS

Plan and produce all materials that will be needed for the activity.

Purpose

If you rely on instructors to develop the necessary materials, they will probably never use the group activity. Also your team has a better pool of expertise for planning and creating the materials than does an individual instructor.

Inputs

- a. The outputs from 11.6.
- b. An EI.

Substeps

11.7.1 Plan the general specifications for all materials that will be needed for the activity.

11.7.2 Plan detailed specifications for each of those materials.

11.7.3 Make or order each of those materials.

- There may be some materials that are on-site at the institution(s) where the instruction is to occur. In such cases, plan a portion of the instructor's manual to direct the instructor to procure them with sufficient lead time, rather than developing them yourself. Make sure that it will be possible for the institution(s) to make a sufficient number of the on-site materials available.

Outputs

- a. All of the materials that will be needed for the activity, with the exception of on-site materials.
- b. If there are any on-site materials, an outline for a portion of the instructor's manual that will direct the instructor to procure such materials with sufficient lead time.

STEP 11.8
PRESCRIBE LEARNER PREPARATION FOR THE ACTIVITY

Decide what advanced preparation the learners should have, including any desired team skills; and develop the necessary instructional materials and instructor guidance for it.

Purpose

Without sufficient advanced preparation, the activity will not be nearly as beneficial as it would otherwise be. And some training in team skills can have a very large impact on the effectiveness of the group activity. Also, you cannot rely on the learners being able to help each other effectively without some guidance. This is especially true for peer tutoring.

Inputs

- a. Procedures from tutoring format.
- b. EI.

Substeps

11.8.1 Decide what information and other kinds of preparation (e.g. practice) the learners should have before the activity itself begins.

- It is often desirable to have the team work and practice together on the activity before the competition, or true performance of the activity, begins.
- If team skills (such as communication, coordination, and cooperation) are primary or secondary objectives of the activity, then plan for the preparation to provide the required amount of instruction and practice in those team skills. Do not expect them to come naturally; they must be taught, including practice.

11.8.2 Decide on an approach or approaches for teammates to be provided with any information and other kinds of preparation selected above.

- This may involve lecture, individualized resources, tutoring, etc.
- Peer tutoring is usually one of the best approaches, especially if cooperation among teammates is an important goal.

11.8.3 Use the appropriate section of this manual to create the instructional materials and guidance for the chosen approach or combination of approaches.

- The necessary materials might include job aides on peer tutoring procedures, flashcards, lesson materials, etc.
- The guidance should be in the form of an instructor's manual that explains how instructors can direct or teach teammates to help each other effectively.
- Specify in the instructor's manual how and when the instructor should teach any team skills identified in Substep 11.8.1 above.

Outputs

- a. A decision as to what advanced preparation the learners should have, including any desired team skills.
- b. Any instructional material required for that advanced preparation.
- c. A section of the instructor's manual dealing with the implementation of that advanced preparation.

STEP 11.9
FINISH THE INSTRUCTOR'S MANUAL

Insure that instructors are aware of the importance of having a wide range of ability levels among teammates. Also, provide instructors with information on when and how to reorganize teams. Then integrate all sections of the instructor's manual.

Purpose

Higher ability teammates can act as peer tutors for lower ability teammates. This will not only help the lower ability learners, but it will also give the team members added practice in cooperation. Also, personality conflicts and confrontations can occur between teammates. Hopefully these problems can be solved without changing team membership; however, this is not always possible. Therefore, instead of having the team continue under the disruptive stress of internal conflict, it is better to reorganize the team.

Inputs

- a. Learner analysis
- b. EI.

Substeps

11.9.1 Specify in the instructor's manual that the instructor should make sure that there is an equal number of higher, intermediate, and lower ability learners on each team.

- Explain to the instructor how to use a learner analysis as the basis for classifying each learner as either higher, intermediate, or lower ability.

11.9.2 Provide instructors with information on when and how to reorganize teams.

- Several factors influencing when to reorganize teams include:
 - Severe personality conflicts
 - Mismatch of ability levels
- Specify that it is often only necessary for the instructor to make a few small changes in the team membership to solve the existing problems. But also specify that those changes should result in team membership that meets the specifications that you laid out earlier in the instructor's manual.

11.9.3 Integrate all sections of the Instructor's Manual, and create any additional guidance that you feel would be useful.

- Be careful not to make the manual long-winded. Instructors appreciate guidance that is concise and to-the-point.
- Allow for and encourage some instructor creativity. Along these lines, it may be helpful to indicate some boundaries within which modifications would be acceptable, so as to prevent the important effects of the activity from being destroyed.

Outputs

- a. A complete instructor's manual, including
 - a section that specifies the importance of heterogeneity in team membership.
 - a section that explains how to classify learners by ability level and how to assign them to teams to insure heterogeneity.
 - a section that describes when and how to reorganize teams.

CHAPTER 5
LECTURE

STEP 11
CREATE THE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 3
LECTURE

Overview

- 11.1 Allocate content to sequenced lectures.
For each lecture:
 - 11.2 Outline the content sequence for the lecture.
Next lecture.
- For each lecture:
 - 11.3 Select type of lecture.
 - 11.4 Plan media and materials.
 - 11.5 Revise outline and assemble materials.
 - 11.6 Develop lecture notes.
Next lecture.
- 11.7 Develop the instructor's manual.

STEP 11.1
ALLOCATE CONTENT TO SEQUENCED LECTURES

Identify, select, and analyze all related skills and knowledges for which the lecture is to be used. Then plan the length of each lecture, and allocate the content to sequenced lectures.

Purpose

It is highly unlikely that lecture has been selected as the only instructional approach for this block. Therefore, it is important to clarify what content and what basic strategy components for that content will be presented via lecture.

Inputs

- a. The selection of skills and knowledges to be taught by the lecture approach for this block (from Step 9).
- b. The "blueprint" for each of those same skills and knowledges (from Step 5).
- b. An EI.

Substeps

11.1.1 Inspect the results of Step 4 for this block, and cross out all skills and knowledges for which lecture was not selected. This will result in a sequenced list of content to be taught via lecture.

11.1.2 Pick one of the skills and knowledges listed in Substep 11.1.1, and decide whether or not lecture can and should be used for all the basic components prescribed in Step 5 (presentation, generality, examples, and practice).

11.1.3 If repetitions, examples, and/or practice are to be included in the lecture, then decide the number of each that will be incorporated.

- For the remember model, this entails determining the number of prescribed repetitions and alternative representations of the presentation and practice that will be incorporated into each lecture.
- For the application model, this entails determining the number of prescribed examples and practice that will be incorporated into the lecture.

11.1.4 For the prescribed components that will not be incorporated into the lecture, plan what approach will be used to present them. Then repeat Substeps 11.1.2 - 11.1.4 for each remaining skill or knowledge.

- Options include individualized materials in the form of handouts (take-home written materials) or CAI (Computer-Assisted Instruction), group activities, tutoring, and perhaps others.

11.1.5 Plan the length of each lecture, and allocate the skills and knowledges and their prescribed components to sequenced lectures.

- Keep in mind that since lecture tends to be fairly passive for the learner, physically active soldiers tend to get bored and sleepy if the lecture goes much longer than 10 or 15 minutes.
- Logistics of the target institution(s) are important factors to consider.
- This Substep results in a decision as to what will be taught in each lecture, and we have already decided to what degree it will be taught (Substeps 11.1.2 and 11.1.3).
- It may be advantageous to review and modify, where necessary, the previously established instructional sequence (from Step 4) to accommodate the lecture approach.

11.1.6 Determine the general setting in which the lecture should be conducted.

- Identify where the instruction should or must take place: in the classroom, in the field, in large or small areas, near sites where the actual job will be performed, etc.
- Choose a setting in which there is availability of any materials or equipment that are used during performance of the skill.

Outputs

- a. The allocation of all skills and knowledges and their basic strategy components to individual lectures, including decisions about the length, sequence, and setting(s) of those lectures.
- b. A plan for the approach(es) for presenting the prescribed repetitions, examples, and/or practice that will not be presented by lecture.

STEP 11.2
OUTLINE THE CONTENT SEQUENCE FOR EACH LECTURE

For each lecture, create a rough outline of the content in order of presentation.

Purpose

The developer must form a general idea of what the lecture is going to be like before he or she can start developing the lecture notes and/or manual and the instructional media.

Inputs

- a. Output of Step 11.1.
- b. Sequence prescriptions (from Step 4).
- c. An EI.

Substeps

11.2.1 Pick the first (next) lecture.

11.2.2 Based on the sequence prescriptions from Step 4 and on the intuition and experience of the EI, design a rough outline of the lecture for the skills and knowledges allocated to this lecture.
o The content should be arranged in the order of presentation.

11.2.3 Repeat Step 11.2 for each remaining lecture identified in Step 11.1 above.

Note

It is important to keep in mind that this is just a general idea of the structure of the lecture and not the final design.

Output

- a. A general content outline of each lecture.

STEP 11.3
SELECT TYPE OF LECTURE

Based on the prescribed nature and richness of the examples and practice, pick one lecture and decide what type of lecture it should be (interactive vs. non-interactive, and informational vs. demonstrational).

Purpose

There are four types of lecture, each of which is best for a different kind of skill or knowledge.

Inputs

- a. An EI.
- b. The content and sequence description (from Step 11.2).
- c. A "blueprint" for each skill and knowledge (from Steps 5 and 6).

Substeps

11.3.1 On the basis of the purpose of the lecture and the requirement for practice (from Steps 5 and 6), select the type(s) of lecture to be used:

- noninteractive informational lecture
- interactive informational lecture
- noninteractive demonstrational lecture
- interactive demonstrational lecture.

A lecture need not be a pure version of one of these types. Rather, it can be a combination of the various types. Nevertheless, the types are useful for thinking about what characteristics should be used when in a lecture.

- If the purpose is to teach a procedure or skill, then you should usually use the interactive demonstration.
- If the purpose is to teach some procedure or skill that either does not require immediate practice, or requires practice to take place under conditions than are not available in a lecture situation, then use the noninteractive demonstration.
- If the requirements of the instruction (from Steps 5 and 6) do not call for the use of demonstrations (either because it is a remember-level task or because the application-level task is easy enough to not require a demonstration) but the requirements do call for providing students with practice and immediate feedback, then use the interactive information lecture.
- If the purpose of the lecture is only to provide information that is relatively easy to remember, then use the noninteractive informational lecture format.

Output

- a. Specifications for the type(s) of lecture to be used for one lecture.

STEP 11.4 PLAN MEDIA AND MATERIALS

Plan the general nature of the media and materials that will be used with this lecture, based on the various objectives and type of lecture.

Purpose

The use of instructional media can have a very positive effect on a lecture. Each instructional medium, however, has its own individual set of attributes, and the developer must systematically select the most appropriate attributes for a given instructional objective.

Inputs

- a. The nature of the task and the major components selected for this lecture (from Step 11.1).
- b. Type (or combination of types) of lecture (from Step 11.3).
- c. Learner analysis, especially regarding motivation.
- d. EI.

Substeps

11.4.1 Select the basic attributes of media and materials that should be used with this lecture.

- Use the entry characteristics of learners, the location of the instruction, and the nature of the task in making this decision.

11.4.2 Plan the general nature of the media and materials that best provide the selected attributes.

Guidelines

- Hand-outs can be used in almost any circumstance and are generally inexpensive. However, their greatest virtue lies in the fact that learners can take them home for later study and review as well as future reference.
- Motor-skill training will be best mediated by real objects, operational mock-ups, movies, or audio tapes, by which students can listen to instructions and perform the task at the same time.
- If the instruction is a procedural demonstration, then real objects, models, or moving-picture presentations are better than static forms such as film strips, diagrams, drawings, chalkboard presentations, etc. Audio presentations can be effective in accompanying interactive demonstrations.
- If the purpose of the instruction is to teach repair procedures for a particular thing, exploded-parts diagrams will be more appropriate than printed parts lists.
- If instruction is to immediately precede practice, or is to incorporate practice, then use models or real objects where available.
- Overhead projectual methods should not be prescribed for outdoor, daytime instruction, but large poster-type displays might be very effective.
- Moving picture presentations work well in demonstrating a procedure but are too expensive to be used as a method of showing simple diagrams or still pictures.

- If the lecture is not demonstrational, then more static forms of media will suffice.
- Always consider cost, availability, and ease of application in the selection of media.
- When the trainees are practicing a procedure as the instructor is teaching it, then more stress should be placed on audio aids so students can concentrate better on manipulating the objects being used in the procedure.
- When individual practice will follow the demonstration, each step should be shown graphically (by diagrams, film, etc.) and demonstrated by the instructor before the trainees attempt to duplicate the procedure.
- For more guidance on the selection of media and materials, see the following:

An excellent review of media selection models:

Reiser, R.A., and Gagne, R.M. Characteristics of media selection models. Review of Educational Research, 1982, 52, 499-512.

For descriptions of specific media selection models:

Anderson, R.H. Selecting and Developing Media for Instruction. New York: Van Nostrand Reinhold, 1976.

Bretz, R. The Selection of Appropriate Communication Media for Instruction: A Guide for Designers of Air Force Technical Training Programs. Santa Monica, CA: Rand, 1971.

Briggs, L.J., and Wager, W.W. Handbook of Procedures for the Design of Instruction (2nd ed.). Englewood Cliffs, NJ: Educational Technology, 1981.

Gropper, G.L. A behavioral perspective on media selection. AV Communication Review, 1976, 24, 157-186.

Kemp, J.E. Planning and Producing Audiovisual Materials (4th ed.). New York: Harper & Row, 1980.

Reiser, R.A., and Gagne, R.M. Selecting media for instruction. Book in preparation, 1982.

Romiszowski, A.J. The Selection and Use of Instructional Media. London: Kogan Page, 1974.

Training Analysis and Evaluation Group. Staff Study on Cost and Training Effectiveness of Proposed Training Systems (TAEG Report No. 1). Orlando, FL: Training Analysis and Evaluation Group, 1972.

Output

- a. General specifications for media and materials necessary to support this lecture.

STEP 11.5 REVISE OUTLINE AND ASSEMBLE MATERIALS

Revise and further elaborate the rough content sequence created in Step 11.2 above. Finalize the media/materials plan, and assemble and/or develop the media and materials.

Purpose

At this point the developer will have gathered and generated enough information to enable him or her to revise and finalize the general outline. The outline must be finalized before the actual lecture notes can be developed. A revised and finalized lecture outline will enable the developer to now finalize the media plan and develop and/or assemble the instructional media and materials.

Inputs

- a. Lecture content outline (from Step 11.2).
- b. Selection of type of lecture (from Step 11.3).
- c. Media/materials specification (from Step 11.4).
- d. "Blueprints" for the skills and knowledges to be taught (from Steps 5-7).
- e. EI.

Substeps

11.5.1 Make any revisions in this lecture's outline that the media and materials specifications may make desirable, and add major strategy components (from Step 5) to the outline.

- You may want to group content that requires the use of the same media or materials, especially if they are in different locations.
- Be sure that the content is sequenced in such a way that prerequisite skills are taught before the skills for which they are prerequisite.
- Include specifications for implementing the major strategy components prescribed in Steps 5-7.

11.5.2 Review and revise the media/materials plan on the basis of the revised lecture outline (from Substep 11.5.1).

- If the lecture outline presents problems with the media and materials selection as it has been planned up to this point, revise the plan to accommodate the lecture.
- The relationship between the lecture outline and its media and materials can be interactive, and several stages of revision in both may have to occur before both are thoroughly designed and developed.
- You may need to go through several iterations of Substeps 11.5.1 and 11.5.2. This is an interactive process -- it is usually not productive to try to finalize the lecture outline before the media/materials plan is close to final, and vice versa.

11.5.3 Collect, modify, or develop all pertinent instructional media and materials that have been planned for use in each lecture.

- Perhaps new materials will have to be created as a result of the lecture structure, or perhaps existing media and materials may require revision or rejection.

Outputs

- a. A finalized content outline for this lecture.
- b. All media that are needed for this lecture (selected, modified, and/or developed).

STEP 11.6
DEVELOP LECTURE NOTES

Create lecture notes for this one lecture.

Purpose

Lecture notes are necessary for providing continuity and consistency throughout the lecture, and better quality control will be achieved by providing them for the lecturer.

Inputs

- a. The revised content outline (from Step 11.5).
- b. All media and materials needed for this lecture (from Step 11.5).
- c. EI.

Substeps

11.6.1 Prepare notes for the main body of the lecture, based on the revised lecture outline.

- If the lecture is to be interactive, question and feedback points should be determined and noted throughout the lecture notes.
- In the case of demonstration lectures, points of instructor feedback and student activities should be specified.
- Indications should be given where various media and materials are to be employed, and suggestions should be offered for their most efficient and effective use.
- Specific-use instructions should be appended to the instructor's manual, and the instructor should be notified that they are included.
- Make sure that a proper amount of time is allocated to each skill and knowledge in the lecture. This will be based on difficulty level (from Step 6) and importance of each skill and knowledge.
- Where practical, have media and materials physically on hand so that as notes are being developed, media and materials may be directly checked against them for fit.

11.6.2 Prepare the introduction.

- If the lecture is introductory, provide a broad outline of what is to come in the block and/or course.
- If the lecture is related to previous ones, then provide a brief review of the previous material and indicate how it relates to the present presentation.
- Show the context of the specific lecture that is being presented within the overall series of lectures.
- If the lecture is last of a series, then introductory remarks should indicate how it will act as a "wrap-up" for the series. In addition, it can include a review of the major points, how the block fits into a larger frame, a restatement of the rationale for the block, and a review of what the trainee is expected to do with what has been taught.
- Indicate the objectives of this lecture, preferably by demonstration, and give a clear explanation of what is expected of the learners.
- If the presentation is a demonstration, make clear to the learners the range of what they should be able to do when they complete the session.

- If the presentation is an informational lecture, describe how the students will be expected to demonstrate that they have learned the material, e.g. what type of test is to be given, what level of understanding will be required, what amount of error will be accepted.
- If appropriate, select an anecdote that will be understandable to trainees, and that is relevant to the subject. Such stories are usually used if the subject matter needs to be made more interesting and/or more memorable. An anecdote should be personal (about situations students can recognize, at least as types they are familiar with) and should be directly related to the subject of the lecture. Anecdotes should be simple and fairly short.

11.6.3 Prepare the conclusion.

- This entails preparing a review of the content covered and a summary of the entire block (if lecture comes at the end of a larger block), to be presented at the end of each lecture.
- As a result of any questions raised in the interactive portions of the lecture, any unresolved problems or unclear situations should be clarified and integrated in the conclusion.

11.6.4 Outline points that should be addressed in the instructor's manual.

- The lecturer notes should only contain things that the instructor needs while "at the podium". Such things as instructions about how to use any media, eye contact, enunciation and diction, and body language are all inappropriate for the instructor to take to the podium, and therefore they should be included in the instructor's manual rather than in the lecture notes. However, it is sometimes a good idea for the notes to reference things explained in the instructor's manual (e.g., "This is a good time to use the revelation technique for displaying overhead transparencies as described on p. 32 of the instructor's manual.").

11.6.5 Repeat Steps 11.3 - 11.6 for each remaining lecture outlined in Step 11.2.

Output

- a. Detailed lecture notes for all lectures in this block.

STEP 11.7
DEVELOP THE INSTRUCTOR'S MANUAL

Create a manual for instructors.

Purpose

The manual will be a ready reference for subject matter presentation, delivery management, learner management and other lecture guidelines.

Inputs

- a. Lecture notes (from Step 11.6).
- b. Media specifications (from Step 11.5).
- c. EI.

Guidelines

- Instruction in basic public speaking procedures should be provided (e.g. guidelines on job-card-type review sheets or formal public speaking guidelines).
- Provide suggestions for appropriate delivery strategies to be used by instructors, (e.g. use of eye contact with individuals in group).
- Provide instruction in the proper use of microphones, podia, overhead projectors, and other platform tools.
- Provide appropriate guides for the general use of media.
- Provide lists of hardware required for each lecture.
- Give instructors guidelines in using the lecture notes and the media and materials.
- Provide suggestions for preparing for each lecture, including review of lecture notes and practice of the presentation.

Output

- a. Physical package including all material required for lecture together with management and delivery suggestions.

CHAPTER 6
TUTORING

STEP 11
CREATE THE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 4
TUTORING

Overview

- 11.1 Choose the type of tutoring.
- 11.2 Specify the general outline of the tutoring program.
- 11.3 If remedial: Select and sequence the content.
- 11.4 Plan specifics: Establishing rapport.
- For each skill and knowledge:
 - 11.5 Plan specifics: Presenting generalities and examples.
 - 11.6 Plan specifics: Providing practice.
 - 11.7 Plan specifics: Providing feedback.
 - 11.8 Plan specifics: Enriching the instruction.
 - 11.9 Plan media and materials.
- Next skill or knowledge.
- 11.10 Select or develop the instructional materials and media.
- 11.11 Develop a manual for the tutor.
- 11.12 Produce tutor management procedures.

STEP 11.1
CHOOSE THE TYPE OF TUTORING

Choose either adjunct or "stand alone" tutoring for the skills and knowledges allocated to tutoring in this block. Then select either professional or peer tutoring.

Purpose

The characteristics that tutoring ought to have will be affected by the choice of adjunct or stand alone tutoring, and also to some extent by the choice of professional or peer tutoring. Therefore, it is important that these choices be made at the beginning of the development process.

Inputs

- a. The skills and knowledges selected for tutoring (from Step 9).
- b. Learner analysis results.
- c. An experienced instructor (EI).

Substeps

11.1.1 Choose between adjunct and "stand alone" tutoring.

- "Stand alone" tutoring is tutoring which is not supplementary to another instructional approach, such as group instruction or individualized instruction. It is the main source of instruction.
- Adjunct tutoring is often used to provide practice and feedback (sometimes remedial) to supplement other instruction.
- Choose adjunct tutoring if the expository portion of the instruction (generality, example) is more effective or feasible in group or individualized self-instruction.
- Stand alone tutoring is especially appropriate if:
 - (1) the trainees are unable to use group or individualized self-instruction, or
 - (2) the learning task is unique and there are relatively few trainees, or
 - (3) the nature of the task is such that there is little or no expository portion of the instruction.

11.1.2 Choose between professional and peer tutoring.

- Professional tutoring is more attractive if:
 - (1) the learning task is too complex to train peers, or
 - (2) peers are not available, or
 - (3) the task is unique and/or there are only a few trainees.
- Peer tutoring is more attractive if:
 - (1) there is an insufficient number of qualified professional instructors for all the trainees or the cost of sufficient qualified professionals is too great, or
 - (2) the task is easily structured and peers can be trained, or
 - (3) trainees distrust professional instructors, or
 - (4) there are sufficient instructional or personal benefits for the peer tutor to outweigh any disadvantages.
- When students are placed in a class based on one set of criteria but have varying abilities in another critical area (usually a support skill -- e.g., using a library), then peer tutoring can be very useful.
- Using recent graduates as peer tutors can be very effective, especially for transferring skills to a real-world environment.

Output

a. A statement describing the type of tutoring that should be used.

NOTE: In the steps which follow, most instructions apply equally to both professional and peer tutoring. Those instructions which apply only to peer tutoring are indicated with an asterisk (*).

STEP 11.2
SPECIFY THE GENERAL OUTLINE OF THE TUTORING PROGRAM

Plan the general characteristics of the tutoring materials, procedures, and facilities. Keep in mind that this is just a general idea of the characteristics of the program and not the final design.

Purpose

The developer must have at least a general idea of the characteristics of the tutoring program before starting to develop the instructional materials and sections of the tutor's manual.

Inputs

- a. Nature of the skills or knowledges allocated to tutoring in this block (used in Step 11.1).
- b. Sequence prescriptions for those skills and knowledges (from Step 4).
- c. Type of tutoring (from Step 11.1).
- d. EI.

Substeps

11.2.1 Based on the above inputs, plan the general nature of the materials, procedures and facilities that should be used for the entire set of skills and knowledges allocated to tutoring in this block.

11.2.2 Identify all the content peculiarities that might require modifications of these normal materials, procedures, and/or facilities, and list these special requirements.

11.2.3 Outline the general specifications of each entry on the list of materials, procedures, and facilities.

Guidelines

- All materials for tutoring should be suitable for one-to-one use.
- A special form of a particular medium may be necessary, such as flashcards instead of printed text materials.
- * For peer tutoring, all materials chosen should be relatively simple to use.

Output

- a. An outline of the important characteristics of the tutoring program (materials, procedures, and facilities).

STEP 11.3
IF REMEDIAL:
SELECT AND SEQUENCE THE CONTENT

If tutoring is used for remedial instruction, break down content into even smaller components if necessary, and identify areas that require extra explanation and/or practice.

Otherwise just skip to Step 11.4.

Purpose

At this point, most of the selection and sequencing has already taken place, but there may be additional selection and sequencing considerations specific to remedial tutoring.

Inputs

- a. The skills and knowledges allocated to tutoring in this block (used in Step 11.1).
- b. The general outline of the tutoring program (from Step 11.2).
- c. Learner analysis.

Substeps

11.3.1 Decide whether or not the tutoring is remedial. If it is not, skip to Step 11.4.

11.3.2 Provide the following guidelines for the professional tutor to select and sequence subject matter.

- Select for extra explanation or practice those areas with which the learners normally have difficulty.
- Further subdivide elements of the learning task to simplify learning.
- Cover only small amounts of material in tutoring sessions.
- Tutor the learner at his or her own level of ability, even if it requires tutoring the learner in prerequisite skills immediately prior to beginning any given part of the prescribed instruction.
- Plan to include periodic review of previously mastered material.
- * Peer tutors should not be expected to make decisions about any major changes in the prespecified selection or sequence of content material (or elements of the learning task). This should be done by the designer or the supervising instructor.

Output

- a. For remedial tutoring, a section in the tutor's manual containing a sequential outline of the subject matter content if the tutor is nonprofessional, or sequencing guidelines for the professional tutor.

STEP 11.4
PLAN SPECIFICS: ESTABLISHING RAPPORT

Specify techniques for establishing rapport with the learner.

Purpose

Tutoring is most effective when a pleasant, supportive, noncompetitive, nonthreatening environment can be provided by the tutor. The developer should provide the tutor with information on how to create such an environment.

Input

- a. Experienced tutor, if available.

Guidelines for establishing rapport with the learner:

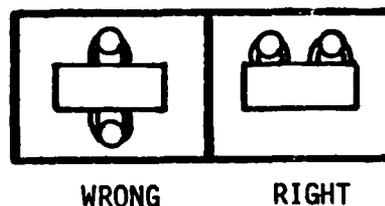
- Socialize. Tutor and learners should meet informally to get acquainted before tutoring takes place.
- Tutor should keep in mind that the learner should always be made to feel liked and feel successful.
- Tutor should be a friend and role model, as well as provide specific help.
- Tutor should not be authoritarian.
- Tutor should not interrupt the learner when he or she is talking.
- Tutor should be patient and not rush the learner.
- Tutor should not be sarcastic or criticize the learner.
- Tutor should occasionally display a good sense of humor.
- Tutor should be kind.
- Tutor should be enthusiastic.
- Tutor should always praise correct answers.
- Tutor should not criticize wrong answers, rather he or she should correct them or ask probing questions that lead the learner to correct himself or herself.
- Tutor should sit next to the learner.
- Tutor should maintain good eye contact with the learner.
- Tutor should maintain an "open posture" -- relaxed, uncrossed arms and legs.

Output

- a. A section in the tutor's manual that provides guidelines for establishing rapport with trainees.

Examples:

- a. Seating arrangements for good rapport →
- b. Tutor's response to correct answer:
"That was correct. You're doing a great job."
- c. Tutor's response to incorrect answer:
"That was a good try, but let's take another look at your answer."



STEP 11.5
PLAN SPECIFICS: PRESENTING GENERALITIES AND EXAMPLES

For a skill or knowledge allocated to tutoring, indicate the methods that should be used for presenting its generality and/or examples (if any).

Purpose

In order for learning to take place, the trainee must be stimulated to make responses that will lead to the acquisition of new knowledge. If tutoring is only an adjunct to group or individualized instruction, methods for presenting generalities and examples may not be required (because they are presented in the primary instructional approach). However, the tutor may have to restate generalities or provide additional examples for the learner while providing practice, especially if the tutoring is remedial.

Inputs

- a. EI.
- b. General outline of the tutoring program (from Step 2), including type of tutoring, type of tutors, characteristics of learning task, facilities.
- c. Learner analysis.
- d. Specifications for the examples and generality for this skill or knowledge (from Steps 5 and 6).

Substeps

11.5.1 Pick a skill or knowledge and decide whether or not a generality should be presented.

- If the tutoring is not adjunct or remedial, then base this decision on the results of Step 5.
- For remedial and adjunct tutoring, practice may be the only basic component of the instruction.
- For some kinds of content, such as concrete concepts, a generality is useless.
- For learners who require concrete representations of knowledge, a generality is useless, and reliance should be placed on examples and practice with feedback.

11.5.2 For that same skill or knowledge, decide whether or not examples (demonstrations, modeling) should be used; and if so, decide when they should be presented in relation to their generality and/or practice.

- If the tutoring is not adjunct or remedial, then base this decision on the results of Step 5.
- Even if the tutoring is adjunct or remedial (and examples have therefore already been presented), a demonstration or two may be necessary as preparation for practice by the learner.

11.5.3 If a generality should be presented for this skill or knowledge (decided in Substep 11.5.1 above), then plan the methods for presenting it.

- The major decision here is whether the generality should be explained alone, or in combination with an example, or as a part of feedback on practice.
- Another important decision is whether to present all of the generality at once, or whether to intersperse bits and pieces of it among the examples and/or practice.

- Be sure to decide when the generality should be presented in relation to its examples and/or practice.
- If the tutoring is adjunct to other instruction, the tutor generally should spend a minimum of time speaking. However, the tutor may want to give directions or clarify or highlight information that has already been presented.

11.5.4 If examples (demonstrations, modeling) should be used for this skill or knowledge (decided in Substep 11.5.2 above), then plan the methods for presenting it.

- Generally, you should plan for an example to immediately precede each practice until the learner can do the practice unprompted.
- The number of examples is an important consideration here. If the tutoring is not adjunct or remedial, then base this decision on the results of Step 5.
- The tutor should follow the steps exactly as the learner is expected to follow them.
- The tutor should describe each step of the demonstration in a clear and informal manner.
- For adjunct tutoring, tutors should demonstrate tasks already presented in the primary instruction in a simpler or slower manner.
- Demonstrations may take the form of role modeling, in which the learner is to imitate certain abstract behaviors, such as correct leadership techniques.

Output

- a. A section of the tutor's manual which describes appropriate methods for presenting the required generalities and examples.

Examples

- a. Use explanation to present information about vowel sounds in remedial reading:
 - "The long vowel 'o' can be spelled several ways:
 - o as in so
 - oe as in toe
 - ough as in dough
 - ow as in crow."
- b. Use modeling to present correct pronunciation of a foreign language:
 - The tutor will say a Spanish sentence with natural speed and intonation so the learner can imitate it.
- c. Use demonstration to present all the steps in solving a mathematics problem.

STEP 11.6
PLAN SPECIFICS: PROVIDING PRACTICE

For this skill or knowledge, decide on the methods for providing practice.

Purpose

Trainees must have the opportunity to practice repeatedly what they are to learn. Active involvement by the trainee will facilitate learning and retention of what is learned. Often adjunct tutoring's main purpose is to provide additional practice for the trainee so that the learning task can be mastered.

Inputs

- a. EI.
- b. All previous tutoring steps.
- c. Practice requirements (from Steps 5 and 6).

Substeps

11.6.1 Produce a section of the tutor's manual that presents the following guidelines for providing practice:

- Allow the learner to respond. Don't do it for the learner and don't interrupt.
- Select practice items at which the learner can succeed, to foster a feeling of mastery.
- Always listen carefully to the learner's response or closely observe his or her performance.
- Devote most of the tutoring session to practice.
- Select practice items which encourage more thinking and assimilation by the learner, such as open ended questions.
- Some possible methods for eliciting learner performance are:

Modeling:

- As a prompt for the practice, the tutor should pronounce, show, write, etc., exactly what the learner is to imitate in a practice exercise.

Cueing:

- As a prompt for the practice, a signal or symbol may be chosen that will indicate to the trainee what is to be done. For instance, pointing to a word indicates that the learner is to read, or holding a flashcard with a math problem on it indicates that the learner should solve the problem.

Coaching:

- A procedure can be devised to coach or prompt the learner to respond properly. Such a procedure usually has the tutor provide an increasing number of prompts until the learner gives the correct answer.
- The coaching procedure is usually used after a relatively difficult practice item is given, and the trainee has not responded correctly.
- Feedback is an integral part of coaching.
- * This is particularly useful for peer tutors.

Questioning:

- The tutor may ask the learner to recall relevant information (the remember model) by asking the learner to name, tell, describe,

identify, etc.

- The tutor may ask questions which require application of knowledge (the application model) by asking the learner to classify, produce, predict, evaluate, compare, contrast, etc.

Output

- a. A section of the tutor's manual which describes appropriate methods for providing practice and feedback.

Examples

Here are some examples of types of questions which you might encourage the tutor to ask.

Questions for the recall level:

What is 9×6 ?

What is this equipment used for?

How many U.S. Senators are there?

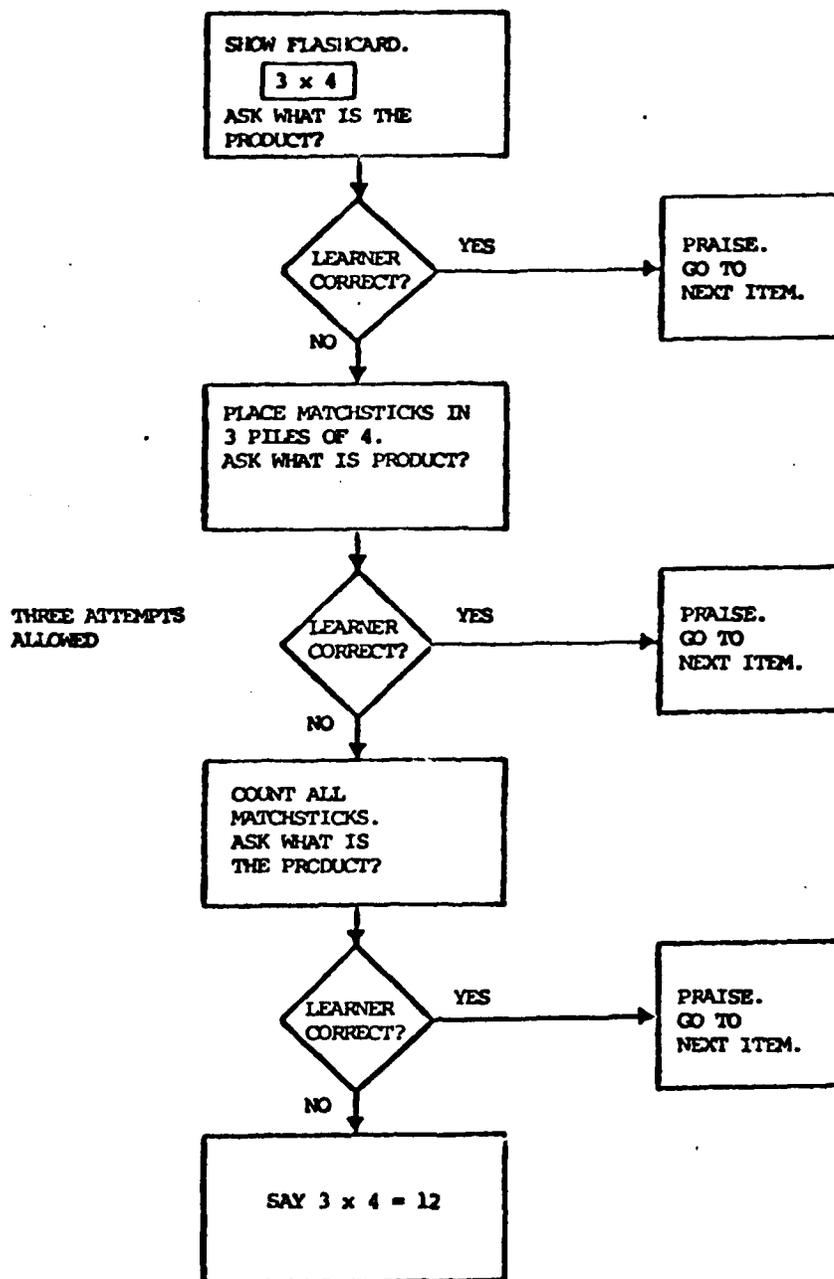
What is the difference between the M1 and the M60 tanks?

Questions for the application level:

Why would you use division to solve this problem?

What do you think is the meaning of this sentence?

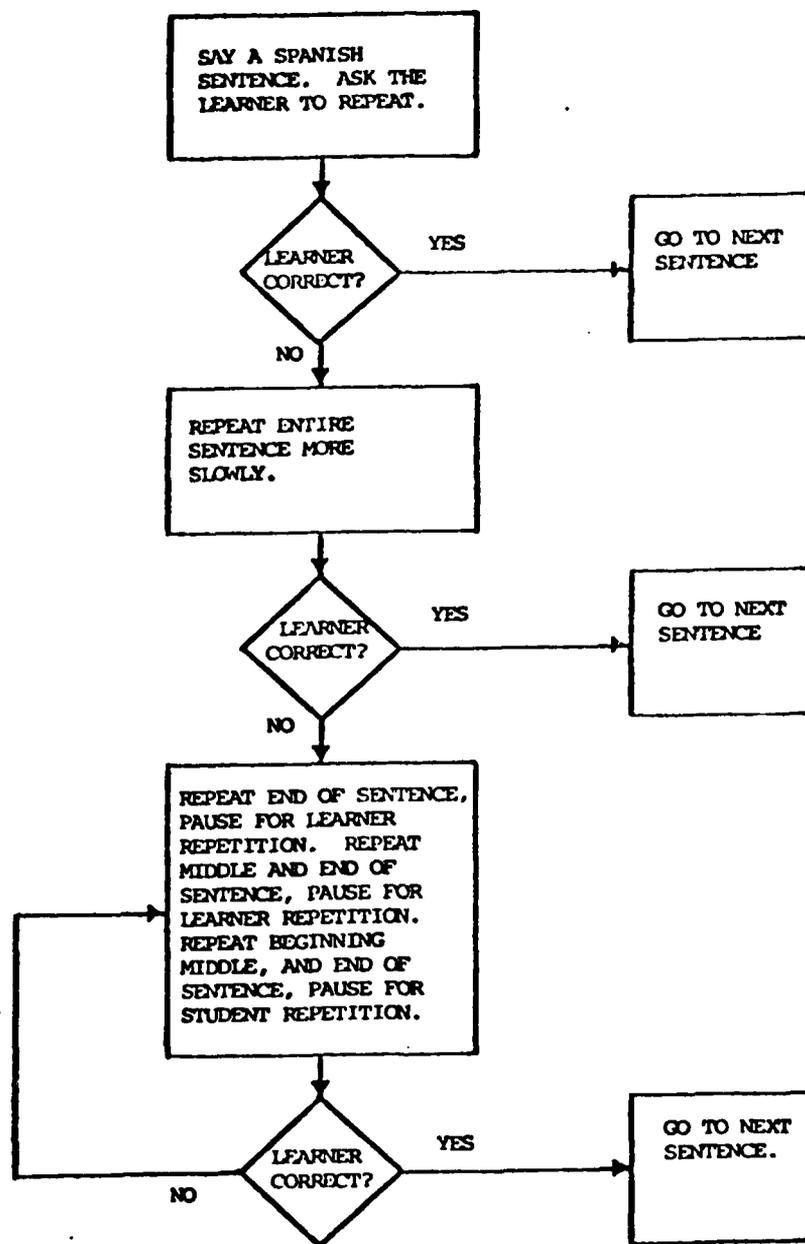
Here is an example of a prompting procedure for tutoring multiplication, which might appear in a tutor's manual.



The tutor's prompting chart should indicate how many attempts the learner is allowed before the tutor supplies the correct response.

(Adapted from similar charts in Thiagarajan, 1978.)

Here is an example of a coaching procedure incorporating modeling, which might appear in a tutor's manual for tutoring a foreign language.



(Adapted from similar procedures found in Colvin, 1980, and Thiagarajan, 1978.)

STEP 11.7
PLAN SPECIFICS: PROVIDING FEEDBACK

For this skill or knowledge specify methods for providing feedback to the learner.

Purpose

Learners should be immediately informed whether their responses are right or wrong. On-the-spot correction of errors will reinforce learning.

Inputs

- a. Feedback specifications for this skill or knowledge (from Steps 5 and 6).
- b. EI.

Substeps

11.7.1 Produce a section in the tutor's manual that provides the following guidelines:

- Feedback should be immediate.
- Praise correct answers.
- Do not criticize the learner for incorrect answers. Handle errors positively.
- Show the learner exactly where the mistake occurred.
- Give the learner specific advice on how to correct a mistake.
- Allow the learner repeated attempts to correct a mistake, if necessary, while providing increased prompting for each new attempt.
- Reassure the learner when you sense insecurity or anxiety.

11.7.2 Provide any additional guidelines and techniques for giving feedback that you think would be helpful.

Guidelines

- * All possible correct answers should be supplied to the peer tutor.

Output

- a. A section in the tutor's manual that gives methods and guidelines for providing feedback to the learner.

Examples

Here is an example of some guidance that might appear in a tutor's manual (adapted from Rosenbaum, 1973).

CORRECTIVE FEEDBACK FOR SPELLING

Student writes: proseedure

Tutor says: You're correct until here (draws line at the beginning of the incorrect part - pro/seedure).

Student writes: proeedure

Tutor says: You're correct until here (draws line at the beginning of the incorrect part - proce/edure).

Student writes: procedure

Tutor says: Good, that's correct.

STEP 11.8
PLAN SPECIFICS: ENRICHING THE INSTRUCTION

For this skill or knowledge, decide on methods for enriching the instruction.

Purpose

Additional aids or devices may be used in tutoring to create motivation and to aid the learner in focusing attention, remembering, or understanding. For example, at times it will be helpful for the tutor to restate, simplify, focus, highlight, summarize, devise mnemonics, create analogies, or provide visual aids.

Inputs

- a. Enrichment components prescribed for this skill or knowledge (from Step 6).
- b. Specifics on the generality, examples, and/or practice for this skill or knowledge (from Steps 11.5 - 11.7).
- c. EI.

Substeps

11.8.1 Plan how the enrichment components prescribed in Step 6 for this skill or knowledge should be used by the tutor to enrich the instruction.

11.8.2 Integrate corresponding guidelines into the tutor's manual.

Output

- a. A section in the tutor's manual that describes methods for enriching the instruction.

STEP 11.9
PLAN MEDIA AND MATERIALS

For this skill or knowledge, plan the media and materials that the tutor should use.

Purpose

The quality of the materials and variety of media usually have a very important influence on the quality of the instruction.

Inputs

- a. The general specifications for materials and facilities (from Step 11.2).
- b. The specifics for this skill or knowledge (from Steps 11.5-11.8).
- c. EI.

Substeps

11.9.1 Provide guidelines for selecting and using media that are appropriate for tutoring and that have attributes which are appropriate for the nature of the task.

11.9.2 Repeat Steps 11.5-11.9 for each remaining skill and knowledge allocated to tutoring in this block.

Guidelines

- It is often useful to present instruction in ways which appeal to more than one of the senses.

Output

- a. A plan for media and materials that should be used for this skill or knowledge.

STEP 11.10
SELECT OR DEVELOP THE INSTRUCTIONAL MATERIALS AND MEDIA

Based on the plans for specifics of the tutoring program, select and/or develop instructional materials and media that are consistent with either the nature of "stand-alone tutoring" or adjunct tutoring.

Purpose

On the whole, both professional and peer tutors cannot be expected to select or develop effective instructional materials by themselves. The developer should provide all but the simplest materials.

Inputs

- a. Plans for specifics of the tutoring program (from Steps 11.5-11.9).
- b. EI.

Substeps

11.10.1 Review existing materials and media.

- See block III. 3 "Review/Select Existing Materials" of the IPISD model.

11.10.2 Modify suitable existing materials to meet the specifications developed in Steps 11.5-11.9, if necessary.

11.10.3 Develop new materials if existing materials are neither suitable nor adaptable.

- You may find much of the guidance in Individualized Resources helpful here.
- If the tutoring is remedial, simplified versions of the primary material may be sufficient.
- For professional tutors, you may want to provide guidelines for the tutor to select or prepare materials and media.
- For peer tutoring, if the tutoring is adjunct to regular group or individualized self-instruction, all selection and preparation should be done by you or the supervising instructor. For large, "stand alone" tutoring programs, tutors may be trained to prepare simple materials.

Output

- a. All necessary materials and media for all skills and knowledges allocated to tutoring in this block.

STEP 11.11
DEVELOP A MANUAL FOR THE TUTOR

Based on the plans for specifics of the tutoring program, develop a tutor's manual with either general guidelines for tutoring or specific detailed steps for every interaction between learner and tutor. This should include instructions as to how to use the materials just developed and/or selected and how to carry out any management procedures, such as prescribing appropriate instruction, evaluating learner performance, and keeping records of learner progress.

Purpose

Without this guidance, the tutor will not know what to do with the media and materials that you have selected and developed.

Inputs

- a. The general tutoring procedures and facilities (from Step 11.2).
- b. The media and materials that are to be used for tutoring (from Step 11.10).
- c. EI.

Substeps

11.11.1 Specify the criteria for deciding who needs tutoring, if the instructor is to select those requiring tutoring.

- * Peer tutors do not select trainees who require tutoring. Supervising instructors should select all trainees for tutoring and assign all tutor/learner pairs.

11.11.2 Specify the methods for diagnosing learner needs and analyzing learner characteristics.

- Use either existing placement tests or performance checklists for diagnosis.
- If such tests are not available, devise the appropriate diagnostic tools, based on the instructional objectives and learner ability level.
- Written tests, observation of learner performance, examination of the learner's instructional record, or private interview with the learner are all possible diagnostic tools.
- * Peer tutors will usually not make preliminary diagnoses; however, they should be given the results of a diagnosis.

11.11.3 Specify the methods for selecting instructional methods if alternatives exist.

- It may be necessary to supply a list of alternate activities, to be selected as required by the tutor. The learner's successes or failures should guide the tutor in selecting the alternate activities.
- * For peer tutors, a checklist based on the predetermined instructional sequence could be provided. This checklist can tell the tutor whether to proceed with the next instructional item, repeat an item, or provide alternative instruction, and it should indicate the number of attempts allowed for all practice items.

- 11.11.4 Specify the methods for recording the learner's progress.
- Informal guidelines can be given but specific record forms will be more helpful for most tutors.
 - * For peer tutoring, provide specific record keeping forms with instructions for their use.
 - * Provide guidance as to when to refer the learner back to the expert (instructor).
- 11.11.5 Specify the scheduling and location requirements.
- Specify the duration and frequency of the tutoring sessions. In general, sessions should not exceed one-half to one hour duration.
 - Provide guidelines for within-session scheduling. Time should be included in each session for socializing, determining problem areas, explanation or clarification, practice, and review.
 - Scheduling for tutoring should be done in advance, and tutoring sessions should not be scheduled when other important or enjoyable activities are going on.
 - Tutoring should be conducted in a comfortable location which is free of distractions. Tables or carrels for two-person, side by side seating should be available.
 - * More detailed guidelines for within-session schedules should be provided for peer tutors.
- 11.11.6 Prepare learner management materials.
- Prepare any necessary diagnostic tests, evaluation tools, prescriptive activity lists, or learner progress record forms.
 - See Block III.2 of the IPISD.
- 11.11.7 Try to think of other management concerns of importance, and address them in the tutor's manual.
- Specify what a tutor should do if rapport cannot be established (e.g., reassignment, etc.).
 - Specify what a tutor should do if the learner does not show up on time or at all.
- 11.11.8 Integrate all previously developed parts of the tutor's manual, and add anything else of importance that you can think of.
- Specify limits and responsibilities of the tutor, such as tutoring in a private apartment, liability in case of accidents during tutoring, compliance with insurance regulations, reimbursement for expenses, etc.
 - Be sure to include guidelines for establishing rapport and giving feedback.

Guidelines

- The degree of detail necessary in the manual will depend on the degree of expertise of the tutor and complexity of the task to be learned, practiced and reinforced.
- If the tutors are professional instructors, a single tutor's manual applicable to a variety of courses may be all that is necessary.
- * All tutoring strategies should be described in detail for peer tutors. Instruction manuals and prompting charts or cue cards should be provided.

Notes

The above substeps are not necessarily sequential.

Output

- a. A tutor's manual which tells the tutor how to establish rapport with the learner, how to provide instruction for the specific learning task, and how to conduct instructional management activities, including:

Tutee selection

Diagnosis of learner needs

Prescriptions for instructional activities

Keeping records of learner progress

Scheduling and physical facilities

Example

Here is an example of a record of progress form which could be included in a tutor's manual.

MATHEMATICS SKILLS PROGRESS FORM

	ADDITION	SUBTRACTION	DIVISION	MULTIPLICATION
WHOLE NUMBERS	PROBLEM MASTERED: SET A _____ B _____ C _____			
FRACTIONS				
DECIMALS				

STEP 11.12
PRODUCE TUTOR MANAGEMENT PROCEDURES

Provide procedures for selecting, training, and monitoring tutors. If the instructor will be the only tutor, incorporate those procedures as direct guidance to the instructor in the tutor's manual. Otherwise create a separate manual for the instructor.

Purpose

It is likely that selection and training of tutors will have a greater impact on the quality of the tutorial instruction than any other prescription in this chapter. Proper monitoring can also have a very large effect on the quality of the instruction.

Inputs

- a. The tutor's manual (from Step 11.11).
- b. EI.

Substeps

11.12.1 If the instructor will not be the only tutor, then create an instructor's manual with guidelines for selecting, training and managing the tutors.

• Selecting tutors:

Good tutors are those who have certain personal qualities:

- patience
- flexibility
- sympathy for learner's problem
- enthusiasm
- sense of humor
- dependability

Also consider specific skills and attitudes that may be important.

• Training tutors:

Training for professional instructors may consist simply of an orientation to the tutoring program. That orientation should include:

- The objectives of the instructional program,
- A description of interpersonal skills necessary for tutoring,
- Criteria for choosing those to be tutored,
- Instructions in using appropriate tutoring strategies,
- Instructions in the use of record keeping or diagnostic tools.

Here are several possible tutor training methods:

- Self-instruction (a tutor's training manual),
- Group instruction (demonstration, observation, role playing, discussion).

• Managing tutors:

- Not all instructors have the desire or capability to manage tutors. Hence, you should provide some mechanism for dealing with this problem.
- Provide guidance for recruiting tutors, establishing rapport with them, keeping track of tutors' hours, paying tutors, motivating them, monitoring the quality of their tutoring, etc., as well as selection and training discussed above.

*11.12.2 For peer tutoring, additional management procedures should be provided for selection, training, scheduling and monitoring of peer tutors.

- **Selecting Peer Tutors:**

For correction and feedback of remember level practice items only, selection criteria for peer tutors are not as important, since there is only minimal interaction with the learner. In this case, tutors and learners receiving the same instruction can even alternate with each other in the roles of tutor and learner.

In selecting peers for more sophisticated tutoring, remember that the tutor is to be a role model for the learner. Those who can reinforce the learner positively should be chosen. Personal qualities such as patience, flexibility, empathy, enthusiasm, sense of humor, and dependability are important.

Sometimes there can be instructional benefits for the tutors. In this case, try to match learners and tutors with similar ability levels. (Placing very high ability tutors with very low ability tutees is not always successful.) The tutor will master the material, if he or she has to teach it to someone else.

- **Training Peer Tutors:**

Peer tutors must receive specific training. Training guidelines should include:

- Necessary subject matter training,
- Objectives of the tutoring program,
- Training in interpersonal skills,
- Training in specific tutoring strategies,
- Instructions in the use of any record keeping forms.

Specify type of training:

- Minimal: Simple instructions given by supervising instructor (if for remember level practice items only),
- Medium: Self-instructional tutor's manual,
- Intensive: Group instruction with demonstration, observations, role playing exercises, discussion of tutoring strategies (especially if tutoring is "stand alone").

- **Monitoring Peer Tutors:**

A tutoring checklist (either a self check or supervisor observation) can be helpful in evaluating the tutor's performance. Include interpersonal skills, tutoring strategies, and management strategies.

- The guidelines for recruiting, selecting, training, scheduling, motivating, and monitoring of peer tutors should be provided for the supervising instructor in a supervisor's manual.

Output

- a. A manual for a professional instructor who supervises peer or nonprofessional tutors, or even professional tutors.

Example

Here is an example of a tutor evaluation form which might appear in a supervisor's manual.

TUTOR RATING SCALE

	SATISFACTORY	NEEDS IMPROVEMENT	UNSATISFACTORY
1. TECHNIQUES FOR RAPPORT			
-FRIENDLY			
-SHOWS EMPATHY			
-POSITIVE			
2. TUTORING TECHNIQUES			
-ALLOW LEARNER TO RESPOND			
-CORRECTS ERROR POSITIVELY			
-PRAISES CORRECT ANSWERS			
-FOLLOWS CORRECT PROMPTING PROCEDURES			
3. USES RECORD FORMS PROPERLY			

CHAPTER 7
GROUP DISCUSSION

STEP 11
CREATE THE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 5
GROUP DISCUSSION

Overview

- 11.1 Group the learners.
- 11.2 Select discussion topics.
- 11.3 Develop management guidelines.
- 11.4 Provide appraisal procedures.

STEP 11.1
GROUP THE LEARNERS

Specify methods of dividing learners into groups.

Purpose

For discussion to be shared equally by all members, it is important that they be somewhat "evenly matched" in verbal and/or analytical skills to prevent some individuals from dominating the discussion. Groups should also be of a small enough size that allows full participation by all members during each session.

Input

a. Learner analysis

Substeps

11.1.1 Specify group sizes.

- Group size will depend on availability of moderators and time allotted to discussion, as well as consideration for full participation by all learners.

11.1.2 Specify the methods of assigning learners to groups.

- Groups may be formed on the basis of commonalities of individual background, verbal or analytical skills, or other criteria appropriate to preventing a few individuals from dominating the discussion.

Guidelines

- Where individuals are widely separated by verbal or analytical skills, form groups so that as close a match of these characteristics as possible will be achieved. Where learners are homogeneous, random selection may be suggested.

Outputs

- a. Group selection procedures
- b. Group size prescriptions.

STEP 11.2
SELECT DISCUSSION TOPICS

Choose categories of topics or issues to be discussed.

Purpose

It is important that topics and issues be well identified and ordered; otherwise, loosely structured groups may go astray of the purpose of the discussion.

Inputs

- a. List of skills and knowledges (and attitudes) allocated to group discussion in this block (from Step 9).
- b. EI.

Substeps

11.2.1 Decide on the length of each session.

11.2.2 Decide whether or not the group will play an active role in selecting and sequencing the topics or issues for discussion.

- If the group will play an active role, skip to Substep 11.2.4

11.2.3 If the group will not play an active role, then select specific topics or issues for each session, and sequence them according to learning prerequisite relationships or simple-to-complex sequencing (from Step 4).

11.2.4 If the group will play an active role, then develop a list of topics or issues for group selection and sequencing.

- Issues or topics should be categorized and presented in blocks where learners or moderators can use the "Chinese Menu" (one from column "A" and one from column "B") selection method in deciding what issues to discuss.

Output

- a. A decision as to length of sessions, number of sessions, and topics or issues to be discussed in each session or to be selected by the group.

STEP 11.3
DEVELOP MANAGEMENT GUIDELINES

Decide whether or not there should be a group moderator. If there should be, then develop management guidelines for the group moderator to use in organizing and conducting the discussion sessions.

Purpose

Sometimes an important goal may be to let the natural leadership emerge from a group discussion, in which case there should be no moderator. However, it is usually helpful to have a moderator, in which case it is important that the moderator be given guidelines and reminders of management methods. Often, when personal interaction becomes antagonistic, direction and control can be jeopardized if not properly handled.

Inputs

- a. EI.
- b. List of issues and topics (from Step 11.2).

Substeps

11.3.1 Decide whether or not there should be a moderator.

- This will depend primarily on whether or not the goals of the instruction include allowing the natural leadership to emerge in a group that will be working together later in the real-world environment.
- Age, maturity, responsibility, homogeneity, etc. of the group are also factors that should be considered.

If there should not be a moderator:

11.3.2 Provide the instructor with guidelines for selecting a "recorder" to keep records of group progress/discussions. Then skip to Step 11.4.

If there should be a moderator:

11.3.3 Provide guidelines for selection of moderators (if appropriate).

11.3.4 Select or develop materials for training moderators.

- Consider training in group dynamics, role-playing, problem definition, problem-solving strategies, and facilitation skills (such as listening, paraphrasing, checking for understanding, non-verbal communication, and summarizing).

11.3.5 Provide goals and objectives for the group.

11.3.6 Provide guidelines for scheduling sessions.

11.3.7 Provide the moderator with categories and/or specific lists of topics or issues.

- Where learners are free to choose topics from available lists, arrange lists so that all general areas of interest to the program will be touched on.

11.3.8 Provide guidelines for presenting issues in real-world contexts.

11.3.9 Provide suggestions with regard to constraints upon groups (ground rules).

11.3.10 Provide procedural guidelines for the moderator to conduct sessions, such as guidelines for determining how active a role he or she is to play in the group.

- Where learners are well-informed or self-directed, moderators may take a passive role in discussions.
- Where learners are less informed or self-directed, you may want the moderator to take a more active role, but caution against talking more than 25 percent of the time.

11.3.11 Provide special media for each session (as appropriate).

11.3.12 Provide suggestions for reading matter and other media for exploration of issues and topics.

11.3.13 Provide moderators with guidelines for handling special occurrences in the group, e.g., individual dominance or reticence, personal antagonisms or strong disagreements.

Guideline

- It would be very helpful to discuss principles of group dynamics, especially those related to individual roles in a group (initiator, gatekeeper, clarifier, opinion-seeker), dangers in teamwork (groupthink, hidden agendas), and prescriptive decision-making techniques (Dewey's reflective thinking, Nominal Group Technique, Mixed Scanning).

Note

Moderators should be reminded that they should not take control of discussions but should only guide and direct (where necessary) the learners' attention.

Output

- a. A decision as to whether or not there should be a group moderator.
- b. If there should be a moderator, some management guidelines and a handbook for moderators.

STEP 11.4
PROVIDE APPRAISAL PROCEDURES

Provide group discussion moderators with recommendations and guidelines for concluding group discussions.

Purpose

It is important for several reasons that groups be appraised and evaluated at the conclusion of each session and program. Students should be given evaluation reports on their performance so that they may compare outside observations with their own perceptions. Also, feedback from learners to moderators affords the program with an opportunity to make improvements.

Inputs

- a. Summative evaluation procedures (if applicable)
- b. Evaluation forms (or the like)
- c. EI.

Substeps

11.4.1 Provide guidelines for collecting observations from group members and the moderator about the strengths and weaknesses of the sessions.

11.4.2 Provide guidelines for evaluating the development of skills, knowledges, and attitudes of each group member, including input from each member about his or her own growth.

11.4.3 Provide guidelines for deciding whether or not the moderator has the necessary attitudes and capabilities for being a good moderator.

Guidelines

- Where "soft" skills or knowledges (those not easily evaluated by standard measurements) are involved, principles of qualitative evaluation should be employed in weighing the value and outcome of the program.
- Where more empirically measurable outcomes result, then use quantitative evaluation measures as applicable.

Outputs

- a. Comprehensive guidelines for instructors and moderators to help them with evaluating the development of each member of the group.
- b. Comprehensive guidelines for instructors and moderators to gather formative data about the strengths and weaknesses of each group session.

CHAPTER 8
INDIVIDUAL AND GROUP PROJECTS

STEP 11
CREATE INSTRUCTIONAL RESOURCES AND GUIDANCE

ALTERNATIVE 6
INDIVIDUAL AND GROUP PROJECTS

Overview

For each project:

- 11.1 Identify prerequisite skills.
- 11.2 Develop goals.
- 11.3 Identify materials and resources.

If appropriate, then:

- 11.5 Provide specific procedures.
- 11.6 Else: Provide a general procedure.
- 11.7 Provide a product-development procedure.

For group projects:

- 11.8 Provide organizational guidelines.

STEP 11.1
IDENTIFY PREREQUISITE SKILLS

Include a section in the instructor's manual that lists the prerequisite skills necessary for successful completion of the project. Also include guidelines that the instructor can follow to determine if the trainees have these prerequisite skills and, if they don't, what the instructor can do to insure that they acquire them.

Purpose

A project team or individual will fail to complete the project in a satisfactory manner if team members do not have the prerequisite skills necessary for success.

Inputs

- a. Task description.
- b. Learner analysis results.

Substeps

11.1.1 Identify prerequisites.

- If the project is made up of tasks that have been previously analyzed, check the task analysis results for prerequisite skills and list them in the instructor's manual.
- If the project includes tasks that have not been analyzed, then follow the procedures in blocks 1.1 and 1.2 of the IPISD flowchart.

11.1.2 Provide guidelines or tests that instructors can use in testing the entry ability level of learners.

11.1.3 Specify the minimum ability (or test score) necessary for successful participation in the project.

11.1.4 Decide on the best instructional methods and approaches for bringing deficient learners up to the necessary entry level, and specify those methods and approaches in the instructor's manual. Finally, select and/or develop any necessary instructional materials using the appropriate sections of this manual.

Outputs

- a. A section in the instructor's manual that contains the following:
 - A list of prerequisite skills
 - Guidelines for determining if trainees have acquired the prerequisite skills
 - Specifications that can be used by instructor to determine the best instructional methods and approaches to be used in bringing deficient trainees up to entry level.
- b. Instructional materials that can be used by instructor to implement the appropriate instructional methods and approaches.

STEP 11.2
DEVELOP GOALS

Decide on the goals and scope of the project or projects for this block, and indicate how much freedom the learner(s) should have to set the goals and scope themselves. You may want to provide guidelines in the instructor's manual that will allow the instructor to decide how much freedom to give the learner(s) in developing their own project goals and scope.

Purpose

Learning and retention are facilitated if learners are given the freedom to choose project problems that have personal meaning and relevance to them. There are, however, a variety of things that tend to narrow the choices that learners should make. The requirements of the service and the learners' lack of ability to set goals in an unstructured, uncontrolled environment are two such restrictive factors. The instructor needs guidance in deciding how much control and how much freedom to interject into the project.

Inputs

- a. Learner analysis
- b. The list of skills and knowledges allocated to projects in this block (from Step 9).
- c. EI.

Substeps

11.2.1 Given the skills and knowledges that have been allocated to projects, help the EI to decide on the goals and scope of the project.

- Be sure to identify the amount of variation that would be acceptable for those goals and the scope.
- You may need to plan more than one project for the skills and knowledges allocated to projects for this block.

11.2.2 Help the EI to decide how much freedom, if any, the learner(s) should have in setting the goals and scope of the project, and specify that amount of freedom in the instructor's manual.

- This should be based both on the nature of the project and the nature of the target learners.
- You may want to give instructions and guidance for the instructor to make this decision.
- Be sure that the instructor judges whether or not the learner(s) can handle that freedom productively and that the instructor restricts that amount of freedom whenever necessary.
- The limits of the freedom may best be indicated by providing a list of alternatives. This will also facilitate the selection of goals and scope for the project.

11.2.3 If the learner(s) can have no freedom to set the goals and scope of the project, then provide a goal statement and a list of objectives appropriate for learning those skills and knowledges, and direct the instructor to provide them to the learner(s).

11.2.4 Specify in the manual how the instructor can help the learner(s) utilize their own drives and purposes as the moving force behind

their learning.

- Such commitment is often crucial to the success of a project.

Output

- a. A section in the instructor's manual that provides the following:
 - A description of the goals and scope of each project for this block, including the acceptable amount of variation in each.
 - A decision as to how much freedom to give the learner(s) in developing and implementing their project goals, or guidelines for the instructor to decide.
 - Guidelines on how the instructor can help the learner(s) utilize their own drives and purposes as the moving force behind their learning.

STEP 11.3
IDENTIFY MATERIALS AND RESOURCES

Provide guidelines in the instructor's manual that will help the instructor to identify and acquire materials and resources that can be used for project development and completion.

Purpose

Depending on project objectives and time constraints, the instructor may want (or you may want the instructor) to provide all necessary materials and resources at the beginning of the project, or may want the learners to participate in developing or locating the necessary materials. Providing the instructor either with a list of possible materials and resources, along with their specifications and locations, or with procedures for acquiring and/or developing them will usually save the instructor and trainees considerable time.

Inputs

- a. Goals and scope of the project (from Step 11.2).
- b. Review of existing instructional materials.
- c. Table of organizational equipment.
- d. EI.

Substeps

11.3.1 Decide if the goals of the instruction would be supported by the learner(s) participating in identifying, locating and/or developing materials/resources for the project; and if so, decide if time will allow such.

11.3.2 Identify materials, equipment, and other resources that could be used for the successful completion of the project, and list them in the instructor's manual, along with the procedures for acquiring them.

11.3.3 If the learner(s) are to participate in acquiring the necessary materials and resources, decide how much guidance should be given to them.

- If the learner(s) require a great deal of guidance, then provide step-by-step guidelines for identifying, locating, acquiring and/or developing the materials, or help the instructor to do so.
- If the learner(s) are to receive limited guidance, then create a few general guidelines to get them started, or help the instructor to do so.

11.3.4 Specify that the instructor should monitor the learner(s) on a regular basis to determine if more guidance is necessary.

Output

- a. A list of materials, supplies, equipment, etc. that are necessary for the successful completion of the project. The list will include the location of the materials and procedures for acquiring them.

STEP 11.4
ADAPT TO CONTEXT

If local climatic, organizational, or other conditions (e.g. terrain) exist that will negatively affect the effectiveness or appeal of the project as it is set forth in the instructor's manual, then include guidelines in the manual that will help the instructor adjust project goals, materials and procedures to better fit such critical local conditions.

Purpose

Some military units have very distinct organizational structures. For example, the authority structure among trainees in a school's military unit, where most of the learners have the same rank, is not as fixed as the authority structure within a rifle company. The way that learners in a school's military unit will organize themselves to develop and complete a project might be quite different than the already fixed organization of a rifle company. Some military units are permanently located in areas of climatic and topographical extremes. There will be differences between the way a project can be carried out in the desert and the way a similar project can be carried out in the arctic. There will also be contextual differences between the different branches. The project manual must take these peculiarities into consideration if it is to facilitate the development of a safe, meaningful, effective project.

Inputs

- a. Target military unit (context) identification and analysis.

Substeps

11.4.1 Identify all the contextual peculiarities under which the project team must work.

- Contextual peculiarities might include the mission and organizational structure of the project, learners' parent military unit and/or school, and the climate, topography, geographical location, etc. of the area where the project is to be undertaken.

11.4.2 Analyze the effect of the contextual peculiarities on the successful completion of the project.

11.4.3 Provide the instructor with guidelines on how to organize resources and activities (including the team structure) to facilitate the successful completion of the project within the context in which the team will be working.

11.4.4 Provide guidelines on how to adapt the project to each individual, if appropriate and necessary.

Guidelines

- If the target military unit is located in an area of climatic or topographical extremes then the instructor's manual should include guidelines to insure the safety of those participating in the project.

Output

- a. Guidelines in the instructor's manual to help the instructor adapt the goals, materials, and general procedures to local conditions.

STEP 11.5
PROVIDE SPECIFIC PROCEDURES

If the requirements of the service or ability levels of the trainees will not allow extra learner freedom, then provide a specific, structured, problem-solving procedure in the manual that is applicable to the nature of the project. This section should provide information on how instructors should teach the procedure to learners and how learners are to use it during the project.

Otherwise skip to Step 11.6.

Purpose

In many cases learners should practice problem-solving skills within the bounds of a highly structured, specific procedure before they should be required to adapt a more general procedure or develop their own problem-solving approach.

Inputs

- a. Description of goals, materials, and general procedures for the project (from Step 11.4).
- b. Learner analysis
- c. EI.

Substeps

11.5.1 Identify an existing, highly structured, problem-solving procedure that fits the nature of the project goals, or modify an existing procedure so that it fits the nature of the goals.

11.5.2 If a suitable existing model cannot be found, then develop a new one that will fit the nature of the goals.

11.5.3 Provide guidelines in the instructor's manual that the instructor can use in teaching the procedure to learners:

- Lesson plans and/or instructional materials (visual aids, flowcharts, etc.) may be useful.

11.5.4 Provide guidelines that learners can follow while using the procedure to complete the project.

Outputs

- a. A problem-solving procedure for the project.
- b. Guidelines for teaching the problem-solving procedure to trainees.
- c. Instructional materials (e.g. lesson plans, visual aids, flowcharts) that can be used by the instructor to teach the problem-solving procedure.
- d. Guidelines that trainees can use to implement the procedure.

Example

A specific model for solving problems (from Tregoe and Kepner):

1. Analyze need/identify problem.
2. Specify problem in terms of enabling and terminal objectives.
3. Identify resources (materials, equipment, personnel, time, etc.)
4. Generate alternative solutions.
5. Evaluate alternatives against the established objectives and available resources.
6. Choose the alternative that is best able to achieve all the objectives under the constraints of available resources.
7. Assess adverse consequences of the solution decided upon.
8. Organize resources to facilitate the solution and minimize the threat of adverse consequences.
9. Anticipate potential needs/problems that might arise during the solution.
10. Take preventive action to remove causes of potential needs/problems encountered during the solution.
11. Outline and sequence activities that make up the chosen solution strategy.
12. Formulate deadlines and schedules for each activity and total strategy.
13. Implement solution by completing activities in correct sequence.
14. Evaluate success of solution and revise if necessary.

STEP 11.6.
PROVIDE A GENERAL PROCEDURE

If the needs of the service will allow the learners extra freedom during the project and the learners are capable of handling the extra freedom, then provide the instructor with information on how to help learners adapt a general problem-solving procedure or develop a new procedure to meet the problems inherent in the learner-chosen goals. Otherwise, go back and do Step 11.5 instead.

Purpose

There is rarely time in the military to allow complete discovery learning. Therefore, general guidelines in problem-solving procedures can be provided to help trainees get started in their projects. Teaching trainees how to adapt a general procedure and/or how to develop a new procedure to solve a specific problem will give them greater flexibility in overcoming real-life problems that cannot be solved within the limitations of any single specific model selected in Step 11.5.

Inputs

- a. Description of goals, materials, and general procedures for the project (from Step 11.4).
- b. Learner analysis
- c. EI.

Substeps

- 11.6.1 Identify an existing, general, problem-solving procedure, or develop a new general procedure, and include it in the instructor's manual.
- 11.6.2 Develop guidelines for adapting the general procedure to any specific situation, and include these guidelines in the manual.
- 11.6.3 Provide guidelines in the manual that can be used by learners to develop their own context-specific, problem-solving procedure.

Note

Any set of procedures provided in the instructor's manual should be general enough to allow trainees a great deal of flexibility in modifying it to fit the specific project.

Output

- a. A section of the instructor's manual that includes the following:
 - A general problem-solving procedure for the project.
 - Guidelines for modifying the general procedure or for developing their own procedure to fit the specific project.

Example

A general model for solving problems (from Roger Kaufman):

1. Identify problem.
2. Develop a solution strategy.
3. Implement solution.
4. Evaluate success of solution.
5. Revise if necessary.

STEP 11.7
PROVIDE A PRODUCT-DEVELOPMENT PROCEDURE

If the objectives of the project call for the team/individual to develop a product of some kind, then provide a section in the manual that specifies a product-development procedure or guidelines. Include instructional information on how best to teach the procedure or guidelines and their use to trainees.

Purpose

The problem-solving procedure that was earlier taught to learners might not provide sufficient information for the development of a product. Therefore, another model that deals specifically with product development should be included in the manual.

Inputs

- a. Goals of the project.
- b. EI.

Substeps

11.7.1 Identify a suitable, existing, product-development procedure that will fit the nature of the project.

11.7.2 If a suitable, existing procedure cannot be identified, then develop a new procedure that will fit the nature of the project.

11.7.3 Provide a section in the instructor's manual that describes the procedure and provides lesson plans and instructional materials for teaching the procedure to the learner(s).

Guidelines

- Keep whichever model that is to be used as simple and easy to follow as possible.

Outputs

- a. A product-development procedure that will fit the nature of the project.
- b. A section of the instructor's manual that provides guidelines for teaching the product-development procedure.
- c. Instructional materials that can be used to teach the procedure.

Example

The following is a possible procedure for writing a report on a project, which is one kind of product:

1. Describe the problem.
2. Describe the objectives.
3. Describe the methods and materials used.
4. Describe the results.
5. Describe the implications or significance of the results.

STEP 11.8
PROVIDE ORGANIZATIONAL GUIDELINES (GROUP PROJECTS ONLY)

In situations where all the members of the project team are the same rank, include guidelines in the project manual that will help the instructor or the group decide upon a suitable organizational structure for the project team.

Purpose

The objectives for the project will influence the type of organization the trainees should take in completing the project. Therefore, the instructor should understand the relationships between objectives and organization and specifically should know which organization would best facilitate the accomplishment of the objectives.

Inputs

- a. Project goals.
- b. Task description.
- c. EI.

Substeps

- 8.1 With the input of the EI, list all primary and secondary objectives for the project.
- 8.2 Match the objectives with the guidelines that follow.
 - If the objective of the project is to provide practice of military operations, then the organization of the project team should be the same as that of the group that normally performs the operation in real life. For example, if the project is a means of practicing platoon tactics, then the project team should be organized into platoon leader, squad leaders, etc.
 - If an objective of the project is to observe the natural leadership abilities of teammembers, then it might be better not to impose any organization on the team at all to enable the natural leaders to take charge.

Output

- a. Guidelines for the organization of groups for group projects.

GLOSSARY

OF

TERMS

The upper case initials following the definition of each term indicates the approach where the term is most prominently used.

IR	Individualized resources
GA	Group Activities
L	Lecture
T	Tutoring
GD	Group Discussion
P	Projects

- Adjunct tutoring - Tutoring which is supplementary to other instruction. T
- Analogy - An idea which is very similar to the idea that is to be learned but which is outside of the content area of immediate interest. When such a highly related idea is already known by the learners, relating the new idea to it can greatly facilitate learning, especially when the new idea is very abstract. IR
- Application model - A set of strategy components which are prescribed as a unit to teach material that learners need to be able to generalize to new situations. IR
- Blueprint - The product of an instructional design activity which lays out design specifications in terms of prescribed instructional strategies. IR
- Coaching - In tutoring, providing the tutee with successive clues or other information which prompt the tutee to respond correctly. T
- Competition - The act of contending against another person or group or against a set of criteria. GA
- Complexity (of generality) - Difficulty of content to be learned in terms of the number of critical attributes, degree of unfamiliarity, number of interrelationships with other content, density of critical information, etc. IR
- Concept - A class of objects, events or ideas which share the same characteristics or critical attributes. IR
- Criterion (pl. criteria) - A standard that a learner must meet before he/she is judged to have mastered a skill. GA
- Critical attributes - Those characteristics of a class which differentiate its members from those of other classes. IR
- Cueing - In tutoring, using a signal or symbol to indicate to the tutee what is to be done for a particular practice item. T
- Demonstration - A form of example which usually entails some action or movement. IR
- Demonstrational lecture - A lecture whose main purpose is to show an audience how something is done by actually performing the task in front of the audience. L
- Divergence - The degree of difference between examples or practice items. IR
- Entry level - The level of performance or knowledge characteristic of entering learners. IR
- Example - A specific instance or case of the skill or idea being taught. IR
- Experiential learning - Learning by doing, most commonly used for skills or rules. IR

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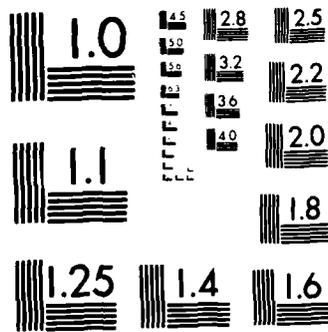
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Expository - Telling (as opposed to Inquisitory, or asking). T

Fact - A fact is information that is to be memorized. "My pen has no ink" is an example of a fact. IR

Feedback - Information given to a learner about the correctness of a response and instructions for correcting errors. T

Formative evaluation - Evaluation used as an aid to improving instruction. GD

Game format - The general make-up of a game which specifies such characteristics as technique, scale, realism, duration, complexity, expense and open-endedness. IR

Games - A form of play with a set of rules, format, and context that help learners to achieve a set of learning goals. IR

Generality - A generality is a statement which applies to more than one instance or case. It may be: (1) the definition of a concept, (2) the statement of a rule, or (3) the statement of a principle. IR

Individualized resources - Instructional materials and/or programs designed specifically to be used by learners on their own. IR

Individualized self-instruction - Instruction which was designed to be self-sufficient and adaptable to learner needs, such that the learner can proceed at his or her own pace and can pick and choose the instructional strategies and content appropriate to his or her preferences or needs. Learners use such instruction on their own.

Informational lecture - Any lecture whose main purpose is to present information through expository communication (telling). T

Information mapping - Prescriptions for layout of instructional displays in such a way as to facilitate learning. It includes prescriptions for formatting, separation, labelling, and highlighting. IR

Instance - A specific case of a generality (concept, rule, or principle). It may be either an example or a practice item. IR

Instance pool - A collection of instances that will later be used as examples, practice, and test items. IR

Instructional approach - A method of instruction. As used in this manual, it refers to one of the following instructional methods:

- individualized materials
- group activities
- lecture/demonstration
- tutoring
- group discussions
- projects. GP

Instructional designer - Any person (military or civilian) who prescribes instructional strategies that meet a given set of instructional requirements.

Instructional developer - Any person (military or civilian) who follows a set of systematic procedures to analyze, design, develop, and validate instructional materials that will be used by instructors and learners.

Instructor's manual - An instructional management tool to help instructors to lead learners through an instructional program.

Interactive lecture/demonstration - A lecture or demonstration where the audience responds overtly to the instructor during the lecture/demonstration. L

Job aid - A display intended to highlight the most essential aspect of a task while the person is performing the task. IR

Learner characteristics - Attributes, traits, or states of learners. Instructional designers attempt to identify those which influence the prescription of instructional strategies. IR

Learner control - Features of the instructional design which permit learners to control content selection, sequence, and/or other instructional components such as pace, practice duration, test frequency and others.

Learning guideline - Information that is given to the learner to facilitate the process of using the instruction. IR

Major components - The most important ingredients of an instructional presentation. Specifically, they may include generality, examples, and practice. IR

Mastery - A predetermined level of success which learners are expected to attain as a result of instruction. IR

Modeling - A performance by the tutor which the tutee is to imitate. T

Non-example - An instance or case which does not exemplify the generality being taught. When presented along with an example that is matched (as similar as possible) to it, it helps to prevent learners from overgeneralizing. IR

Non-interactive lecture/demonstration - A lecture or demo for which the learners are passive, offering no overt responses to the presentation. L

Pacing - The rate at which information is presented to the learner. Self-pacing indicates that the learner can control his or her pace (e.g., a printed book). IR

Peer tutor - A tutor with approximately the same status (rank, age, etc.) as the tutee. T

Performance checklist - In tutoring, a list of successive learning activities which the tutee is to do. T

Positive feedback - Immediate and unthreatening information that advises the learner about the correctness of his or her response and how to correct any errors that may have been made. IR

Practice - An instructional activity in which a learner is expected to make an overt response (i.e. to do a performance). It may be at either the remember level or the application level. IR

Prerequisite - Any skill or knowledge that a learner needs to have acquired before a desired skill can be learned. IR

Principle - A relationship between two changes. It is usually a cause-and-effect relationship. IR

Professional tutor - An instructor or other person who is highly trained in teaching on a one-to-one basis. T

Progression of difficulty - An easy-to-difficult sequence of examples or practice items. IR

Qualitative evaluation - Measurement of effects not readily quantified (counted), such as affective results of a program and attitudes towards the content and/or methods. GD

Quantitative evaluation - Measurable results of observation, e.g., test scores, number of learners passed/failed, etc. GD

Rapport - A pleasant, supportive, nonthreatening relationship between the tutor and tutee or instructor and class. T

Real life situation - An instructional situation with the same conditions as those under which the skill will be used (e.g. on-the-job training). GA

Remember model - A set of strategy components which are prescribed as a unit to teach material that learners need to memorize. IR

Richness (of instruction) - ~~The amount of support and guidance provided by~~ the instruction. It is determined primarily by the number of examples and practice, and the number and types of such things as memory devices, visuals, attention-focusing devices, analogies, and so forth that are included in the instruction in order to adjust the instruction to differences in the complexity of the content and ability level of the learners. IR

Rule (or procedure) - An ordered set of actions or steps to achieve a goal. IR

Sequence - The order of presentation of the parts of the instruction.

Simulated situation - An instructional situation whose conditions approach those of the real world but lack the dangers and cost that a real life situation might entail (e.g. a flight simulator and war games). GA

Simulation-games - An instructional format that involves a game-like hypothetical representation of an educationally relevant situation. Various aspects of reality are differentially emphasized depending on objectives. IR

Subject-matter expert (SME) - A person who is highly knowledgeable in

performing the task that is to be taught.

"Stand alone" tutoring - Tutoring which was designed to be the primary means of instruction and was therefore not intended as a supplement for other forms of instruction. It is the alternative to adjunct tutoring. T

Strategy component - A characteristic of instruction that is prescribed to meet an instructional requirement or requirements. IR

Summative evaluation - Evaluation performed at the end of a session or a program that measures the effectiveness of the instruction. GD

Supervising instructor - In tutoring, the professional instructor who trains and monitors peer or nonprofessional tutors. T

System-control - An instructional situation in which forces other than the learner (e.g., the teacher or computer) control the instruction. IR

Team skills - Those skills that help a group to function efficiently and effectively as a team (e.g. coordination, cooperation, and communication). GA

Tutee - The learner (the person being tutored). T

Tutoring - Teaching on a one-to-one basis. Usually a situation in which one person provides help or guidance to a less experienced person. T

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